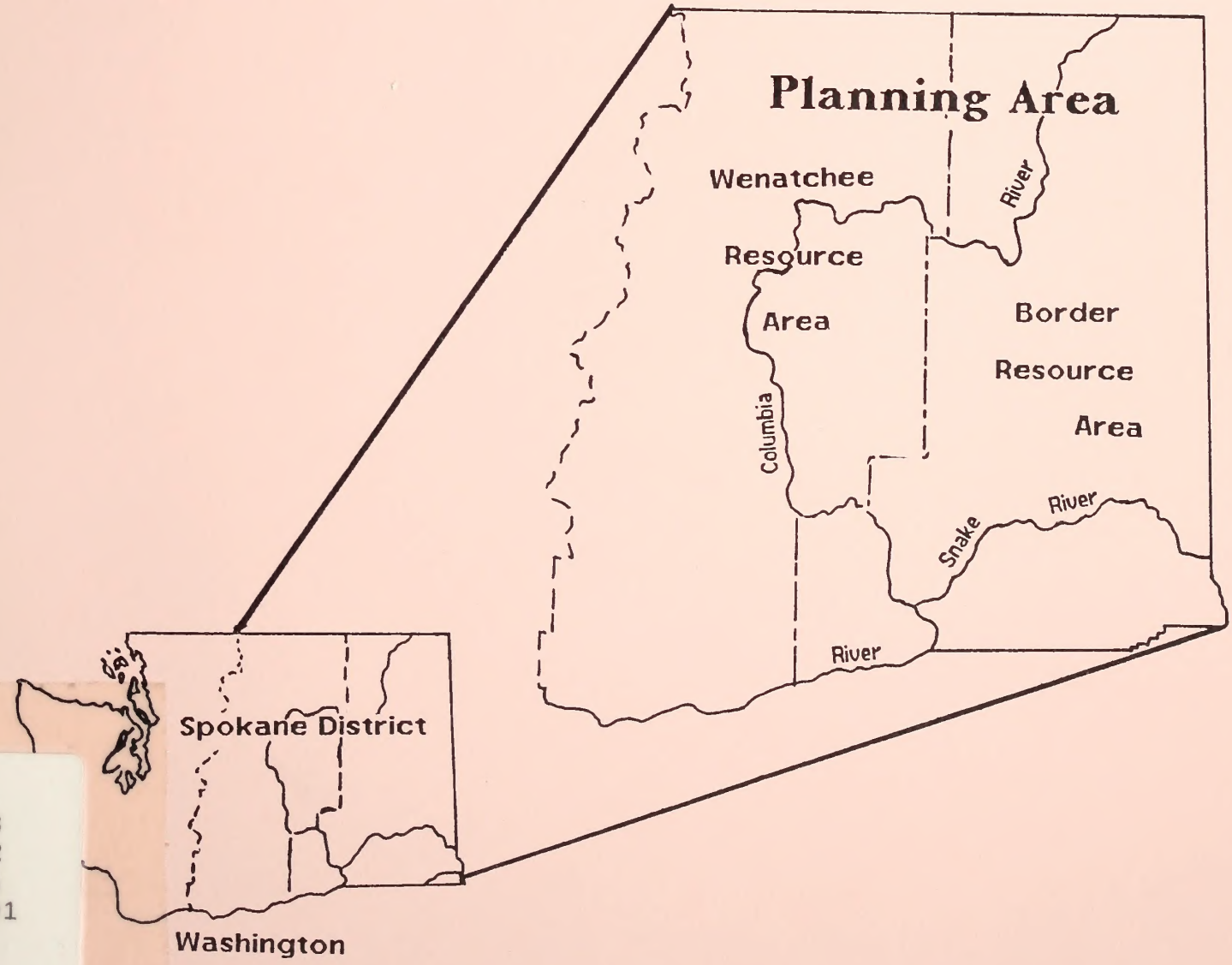
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October 1991

Spokane Draft Resource Management Plan Amendment/Environmental Impact Statement Supplement



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As the Nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering the wisest use of our land and water resources, protecting our fish and wildlife, preserving the environmental and cultural values of our national parks and historical places, and providing for the enjoyment of life through outdoor recreation. The Department assesses our energy and mineral resources and works to assure that their development is in the best interest of all our people. The Department also has a major responsibility for American Indian reservation communities and for people who live in Island Territories under U.S. administration.

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United States Department of the Interior

Bureau of Land Management

Spokane District Office
Wenatchee Resource Area

October 18, 1991

Dear Reader:

This draft Resource Management Plan Amendment/EIS Supplement for the Spokane District is presented for your review and comment. It has been prepared in conformance with planning procedures established under the Federal Land Policy and Management Act of 1976.

This plan amendment addresses the management guidance for fluid minerals, however, it also includes some changes to the existing land use decisions that were made in the Spokane RMP/EIS Record of Decision of 1987.

Any comments you may have on the adequacy of this plan amendment should be directed to Joseph Buesing, District Manager, Bureau of Land Management, Spokane District Office, East 4217 Main Avenue, Spokane, WA 99202 by January 16, 1992. Comments received after the close of the comment period may be considered in the decision process, even though they may be too late to be specifically addressed in the final plan.

Informal public meetings would be scheduled if significant public response indicates additional information or clarification of points brought out in the draft are needed.

If public meetings are scheduled, notification of time and place would be made through the local news media. BLM personnel would be on hand to answer questions regarding the draft analysis and plan.

The Final RMPA/EIS Supplement will identify the changes, if any, in the Preferred Alternative. It should be considered a proposed decision at that time. It would then be subject to a special review opportunity by the Governor of Washington and to protests by parties who may be adversely affected.

Through your participation in this planning process, we believe we can move together toward a common goal of improved public land management in the Spokane District.

Sincerely yours,

Joseph K. Buesing
District Manager

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U.S. Department of the Interior
Bureau of Land Management

Draft
Resource Management Plan
Amendment

Enrivonmental Impact Statement
Supplement

Prepared by
Spokane District

State Director, Oregon/Washington

District Manager, Spokane

Spokane Resource Management Plan Amendment Environmental Impact Statement Supplement

Draft (X) Final ( ) RMPA/EIS Supplement
Department of the Interior
Bureau of Land Management

1. Type of Action: Administrative (X)

   Legislative ( )

2. Abstract: This Proposed Resource Management Plan Amendment/EIS Supplement discusses fluid mineral leasing on Federal Mineral Estate in Eastern Washington. It also discusses proposed changes in management decisions that have developed since completion of the RMP. The proposed changes involve designation of Areas of Critical Environmental Concern, revision to existing Off Road Vehicle designations, restatement of BLM's land tenure adjustment program and administrative changes regarding realignment of Management Area boundaries.

3. The Existing Plan (Alternative 1) proposes leasing of Federal mineral estate with Standard Terms and Conditions. Under this Alternative no additional Areas of Critical Environmental Concern (ACEC) would be designated and Off Road Vehicle designations would remain as indicated in the 1987 Spokane District Resource Management Plan Record of Decision.

   The Amended Plan (Alternative 2) proposes leasing of Federal mineral estate with Standard Terms and Conditions as well as additional leasing stipulations to protect other resource values. Under this Alternative four areas would be proposed for ACEC designation, Coal Creek, Cowiche Canyon, Little Vulcan Mountain and Yakima River Canyon. These designations are designed to provide protection for important botanical values and/or wildlife habitat.

   The designation of two existing ACEC's Webber Canyon and Roosevelt Slope, would be rescinded because subsequent evaluations indicated that the resource concerns the ACEC designation was designed to protect were no longer valid. Under this alternative ORVs would be limited to designated roads and trails on an additional 23,400 acres of public land.

The public review period will be 90 days ending January 16, 1992.

For further information contact:

Joseph Buesing, District Manager
Bureau of Land Management
Spokane District Office
East 4217 Main Avenue
Spokane, WA 99202
Telephone (509) 353-2570

Summary

This plan amendment supplements the Spokane District RMP/EIS and Record of Decision of May, 1987. It addresses the leasing of all the Federal Mineral Estate in Eastern Washington except for land administered by the US Forest Service and Indian Lands. Other resource programs addressed in this plan include off road vehicle designations, and special management areas. Some administrative changes were also stated in this plan amendment along with a restatement of the Spokane District's Land Tenure Adjustment Policy.

Alternative 1 (Existing Plan)

This alternative consists of continued implementation of the RMP without allowing for adjustments in land management decisions (i.e. ORV designations and additional ACEC proposals) based on new information or policy changes. Reconfiguration of management areas is included in this alternative.

Oil and Gas leasing and Development - This alternative is the most simplistic alternative that can reasonably be analyzed, is potentially the least restrictive leasing program the BLM would legally be permitted to implement. Approximately 1.11 million acres of public land and subsurface mineral estate would be open to leasing subject to Standard Leasing Terms and Conditions.

Areas of Critical Environmental Concern (ACEC) - The 12 currently designated ACECs would continue to be managed to preclude land uses that could potentially damage special resource values. No new ACECs would be nominated for designation.

Off Road Vehicle (ORV) Designations - ORV designations would remain as described in the 1987 RMP Spokane District Record of Decision. All 21,000 acres of land acquired since completion of the RMP would remain open to ORV use.

Alternative 2 - (Amended Plan)

This alternative addresses BLM's revised guidelines for fluid mineral leasing and development, and also new prescriptions (i.e., ORV designations and additional ACEC nominations) derived from recommendations of BLM staff and the general public.

Oil and Gas Leasing and Development - Oil and gas resources would be leased with Standard Terms and Conditions as well as additional leasing stipulations to protect other resources and values. The new stipulations are derived from two sources: the existing stipulations and stipulations developed during this plan amendment process. The RMP includes mineral resources of lands managed by other surface management agencies. Therefore, any leasing recommendations made by BLM must take into consideration the missions of these agencies, their policies and restrictions on oil and gas activities, existing withdrawals, and limits imposed by regulations and Congress.

Areas of Critical Environmental Concern - Under this alternative four areas would be proposed for ACEC designation Coal Creek, Cowiche Canyon, Little Vulcan Mountain, and Yakima River Canyon. Coal Creek is being nominated because it contains habitat for a Bureau Sensitive Plant Specie, Cowiche Canyon is nominated for its unique botanical and recreational values, Little Vulcan Mountain is nominated because it provides important habitat for a Bureau Sensitive Animal Specie, and Yakima River Canyon is nominated for its recreational, botanical, wildlife and scenic values.

Two existing ACEC designations, Webber Canyon and Roosevelt Slope, would be revoked or rescinded. Webber Canyon ACEC designation would be revoked because evaluations subsequent to its designation by both contract paleontologists and district resource specialists, indicated that there were no significant paleontological resource values at this site, and that returning this area to multiple use would not result in any deterioration of the values that are present. Roosevelt Slope ACEC was designated because it contained habitat for a Bureau sensitive specie Astragalus misellus v. pauper. Subsequent evaluations or inventories revealed that this specie is more common than initially thought, and because there are no existing land uses that would jeopardize its habitat.

Off Road Vehicle Designations - Most of the ORV designations made in the 1987 RMP Record of Decision would not be changed. Only those areas where new information indicates that additional restrictions are necessary to protect resource values would limitations be proposed. The specific changes being proposed are as follows: Yakima River Canyon and Upper Crab Creek Management Areas ORVs are limited to designated roads and trails (19,200 acres); In the Okanogan Management Area North of the Similkameen River ORVs would be limited to designated roads and trails on another 4,200 acres.

Table S-1 Summary of Long-Term Environmental Consequences and Comparison of Alternative Allocations

	Unit of Measure	Alternative # 1 Existing Plan	Alternative # 2 Amended Plan
Soil (Erosion Potential)		+L	+L
Water			
Quality		NC	NC
Quantity		NC	NC
Vegetation			
Ecological Condition			
Climax	Acres	7493	NC
Late Seral	Acres	35376	NC
Mid Seral	Acres	40725	NC
Early Seral	Acres	59556	NC
Unclassified	Acres	106324	NC
Threatened, Endangered, or Sensitive Species Habitat		No Affect	No Affect
Wildlife			
Upland Habitat		- L	NC
Riparian Habitat		- L	NC
Fish Habitat		- L	NC
Livestock Grazing			
Available Forage	AUMs	30073	NC
Recreation			
Visitor Use Levels		NC	NC
Off-Road Vehicle			
Limitation/Closure	Acres	77100	106400
Open	Acres	250900	221600
Cultural Resources			
Protection of Values		No Affect	No Affect
Visual Resources			
Protection/Enhancement of Visual Quality		- L	- L
Special Management Areas	#	14	16
Forest Products			
Sustainable Harvest Level	MMbf	4	4
Energy & Minerals *			
Closed to leasing	Acres	458000	82200
Open Subject to Standard Lease Terms and Conditions	Acres	1123080	1119000
Open Subject to Timing or Other Constraints, NSO, CSU, Special Administrative Stips.	Acres	494680	880120
Economic Conditions		+ L	NC

+ Increase
- Decrease
L Low
M Moderate
H High
NC No Change

* Includes All Federal Minerals within Planning Area except for Tribal Lands and lands administered by the USFS.

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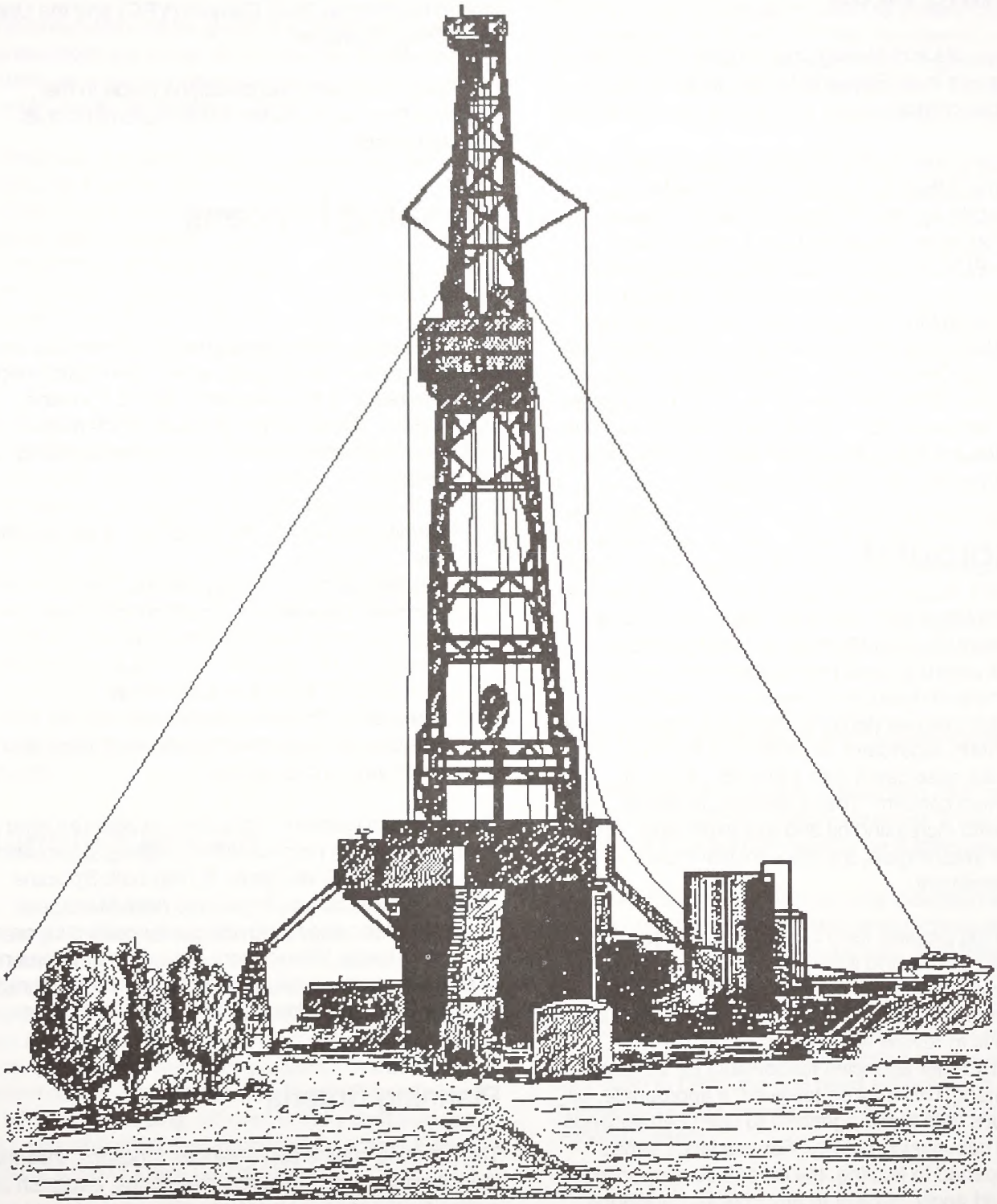
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Chapter 1
Purpose and Need



Introduction

This chapter describes the purpose and need for the proposed action and explains its relationship with other plans and programs, and also the planning process to be used in reaching land management decisions.

Planning Area

The Bureau of Land Management (BLM) administers 328,000 acres in its Spokane District which is considered the planning area.

The planning area in this RMP amendment also includes more than 1.15 million acres of federal mineral estate scattered throughout all counties in Washington state east of the Cascades, lands on which the BLM has oil and gas and/or other mineral leasing authority. These lands include not only those administered by the BLM, but lands administered by the U.S. Bureau of Reclamation, U.S. Fish and Wildlife Service, U.S. Department of Energy, and U.S. Department of Army. This RMP amendment will not address resource issues on BLM-administered land in western Washington nor the BLM-administered mineral estate of U.S. Forest Service and Indian lands.

Background

Since completion of the Spokane District Resource Management Plan (RMP) in 1987, the BLM has revised its planning document guidelines for considering fluid mineral resources. Unless an exception applies, fluid mineral determinations are now required in every RMP, regardless of whether or not fluid minerals are associated with a planning issue or management concern. These revised guidelines, together with increasing oil and gas exploration activity in eastern Washington, are the principal motive for this RMP amendment.

The planning process itself cannot open lands to federal mineral leasing if they have been formally set-aside or withdrawn from operations under various federal mineral leasing laws but may result in recommendations to review withdrawals or restrictions imposed by other agencies responsible for surface management. This may be followed, if appropriate, by negotiations with these agencies to open certain lands to oil and gas leasing activity. For any lands subsequently opened to leasing, the criteria developed in the RMP would apply, subject to any specific conditions imposed by the surface managing agencies.

Also necessitating the RMP amendment is the need to address proposed changes in management decisions that have developed since completion of the RMP. These decisions involve Areas of Critical Environmental Concern (ACEC), administrative changes, revisions to existing Off Road Vehicle (ORV) designations in various areas of the District as well as clarification of BLM's land tenure adjustment program, and issues relating to the management of the BLM-administered land in the Yakima River Canyon (YRC) and the Upper Crab Creek drainage.

Land use allocations and decisions made in the Spokane RMP will continue to be implemented as funding permits.

Planning Process

Overview

The procedure for preparing an EIS Supplement or a plan amendment involves the same interrelated steps that were required for preparation of the Spokane District RMP. Those steps, some of which may occur simultaneously while others may require repeating, are as follows:

- Identification of Issues, Concerns, and Opportunities
- Development of Planning Criteria
- Inventory Data and Information Collection
- Analysis of the Management Situation
- Formulation of Alternatives
- Estimation of Effects of Alternatives
- Selection of Preferred Alternative
- Selection of Resource Management Plan, and
- Monitoring and Evaluation.

The amended resource management plan resulting from this planning process will be a general decision document primarily designed to help both Spokane District and Border and Weatchee Area Managers make decisions and to provide guidance to staff on a day-to-day basis. Where more detailed management direction is required, an activity plan will be prepared after the Plan Amendment/EIS Supplement is completed.

Planning Criteria

The planning criteria serve various functions, including the following: guide resource inventories, establish an outline for the management situation analysis, aid in formulating alternatives, and highlight factors to be

considered in evaluating alternatives and selecting a preferred alternative. Planning criteria specific to the Spokane RMP amendment effort are listed below:

* Inventories will concentrate on identifying unique or important natural resource values subject to potential jeopardization by any oil and gas exploration or development activities. Examples of such areas include unique plant communities, important recreation areas, or crucial wildlife habitat such as sage grouse leks or elk calving areas.

* Consideration will be given to oil and gas leasing stipulations issued by state agencies on adjacent state-owned lands when developing stipulations for public lands administered by BLM.

* Designation of lands under all alternatives will stipulate them as being either:
- Open to fluid mineral leasing subject to standard terms and conditions;
- Open to fluid mineral leasing subject to seasonal or other minor constraints;
- Open to fluid mineral leasing subject to no surface occupancy and similar major constraints; or
- Closed to fluid mineral leasing.

* Recommendations for additional Areas of Critical Environmental Concern will be considered contingent upon their meeting the criteria of relevance and importance, as established and defined in 43 CFR 1610.7-2.

* Management areas that display similar resource values will be combined, if feasible. Combining of such areas should improve management efficiency and reduce duplication of records.

* ORV designations will be re-evaluated in new management areas and revised Management Areas.

Planning Issues

The issues included in this report developed as a result of new guidelines, changes in management guidance, and public response generated during the initial scoping period for the RMP amendment that ended on June 30, 1989. As indicated in the scoping newsletter, issue identification will remain flexible throughout the planning process. New issues could be added almost anytime during the process. Issues currently identified are oil and gas leasing, off-road vehicle designations, and Areas of Critical Environmental Concern. Explanation of each of these issues follows:

Oil and Gas Leasing

There is a need to identify public lands available for oil and gas leasing and to determine the areas where such leasing should be restricted or prohibited.

The BLM encourages the orderly development of mineral resources. Where development conflicts with other resource values and uses, and insofar as the law permits and is practical, the BLM may place constraints on associated mineral activities to lessen the impacts. These constraints could be used to protect cultural resource values, riparian habitat, threatened or endangered species habitat, Areas of Critical Environmental Concern, or other resources of concern. This plan amendment will identify the resources to be protected.

The BLM can recommend withdrawl of lands to congress in order to protect special resource values, thus closing them to mineral entry. BLM may also support or recommend against withdrawals proposed by other agencies which would close lands used for certain purposes. However, withdrawals are rarely needed or justifiable for oil and gas leasing because leasing is a discretionary action and NSO and/or other stipulations or constraints can usually mitigate the concerns.

Typically, the areas in Washington state having the greatest restrictions and/or prohibitions to mineral leasing involve federal lands where surface rights are managed by an agency other than BLM (e.g., Departments of Defense and Energy). Any changes in minerals management must be compatible with the surface managing agency's mission and land use plan, and are usually arranged through a cooperative agreement.

Off-Road Vehicle (ORV) Designations

ORV designations made in the existing RMP resolved most of the land use conflicts; however, a few conflicts have since evolved that need to be addressed.

The main concern involves several thousand acres of formerly private land that have recently been acquired by the BLM through land exchanges. According to BLM policy, all lands are open to ORV use unless it is determined through resource management planning that limitations on ORV use are necessary. Consequently, these newly acquired lands are now categorically open to ORV use and need evaluation to determine appropriate ORV designations specific to their resource values.

Areas of Critical Environmental Concern (ACEC)

The Federal Land Policy and Management Act of 1976 (FLPMA) provides that designation of ACECs be given priority in the development of land use plans. The Act defines ACECs as "areas within the public lands where special management attention is needed (when such areas are developed or used or where no development is required) to protect and prevent irreparable damage to important historic, cultural, or scenic values, fish and wildlife resources or other natural systems or processes, or to protect life and safety from natural hazards."

In consideration of this planning guideline, nominations for potential ACECs in the Spokane District were requested in the RMP amendment process from the public and District resource specialists. There were 21 areas recommended for ACEC nomination, and 4 of these were identified as meeting ACEC criteria and as such will be evaluated for ACEC designation. Two areas have been identified as no longer meeting the ACEC relevance and importance criteria. These areas are identified in Chapter 2 of this amendment.

Other Issues Considered

Additional issues were identified and considered in the planning process, but not fully analyzed. Those issues are listed below along with the reasons for such elimination:

* Fluid mineral leasing and other issues involving BLM-administered land west of the Cascade crest. The public land administered by BLM in western Washington must be addressed in a separate Resource Management Plan because the planning area boundaries encompassed by this plan amendment only extend as far west as the crest of the Cascade Mountain Range.

* Geothermal leasing and development. Historic leasing activities and preliminary scoping results indicated there was insufficient public interest to warrant evaluation of geothermal leasing and development.

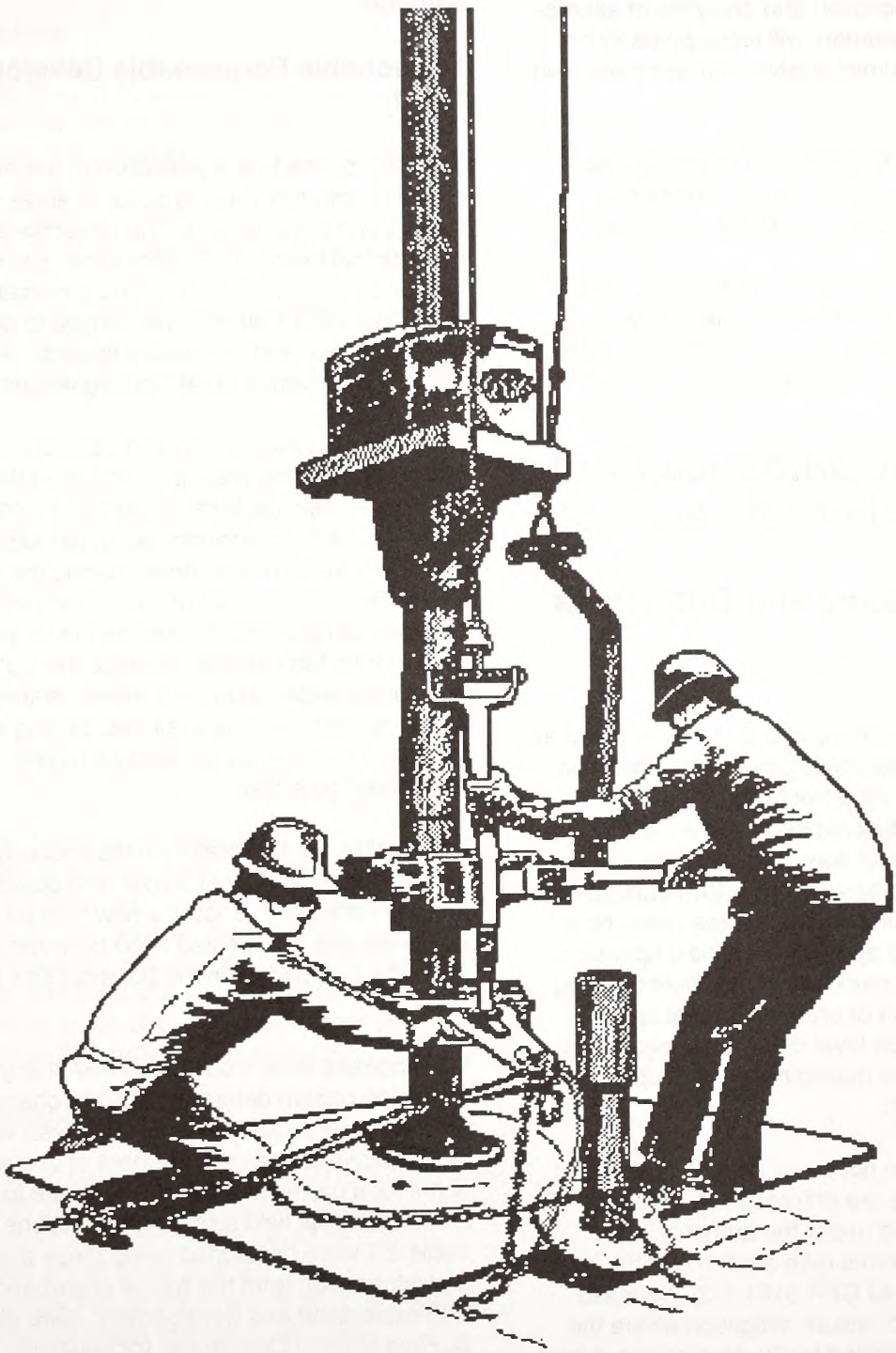
* Withdrawal of the planning area from mineral leasing. According to historical use and projected activities, oil and gas would be the main resource affected under such a closure. This proposal was not studied further because it is contrary to BLM policy (BLM Manual 3100.060 which provides that except for congressional withdrawals, "it is the policy of the Bureau to make public lands available for orderly and efficient development of oil and gas resources under the principles of balanced multiple-use management"). This mineral withdrawal proposal also directly conflicts with BLM's multiple use directives identified in the Federal Land Policy and Management Act of 1976 (FLPMA). Further, public comments received during issue identification for the Spokane District RMP indicate general acceptance of mineral development when managed in an orderly fashion.

Interagency Coordination

During development of this RMP amendment, existing county plans within the planning area were reviewed to assure consistency. Meetings were held with state agencies to verify consistency of land use objectives between BLM and the various agencies. Additional coordination efforts included other federal agencies and Tribal authorities to assure consistent objectives with state, local, Tribal, and other federal natural resource plans, programs and policies. Interagency meetings of this nature will continue to be held throughout the life of the RMP to provide coordinated approaches to regional issues and projects or to proposals that cross administrative lines.

This type of coordination between the Bureau and other federal agencies, state and local governments, and Indian Tribes is required under Bureau planning regulations (43 CFR, Part 1610.3) and by several cooperative agreements or memoranda of understanding.

Chapter 2
Description of Alternatives



Scope of Alternatives

The goal and objectives of the Spokane District's current RMP have not changed, and will continue to guide the management of the public lands for the next 5 to 10 years. However, an amendment to the RMP is appropriate to address three issues affecting the current plan and some administrative changes believed to be necessary. All land use allocations, decisions, and other aspects of the RMP would continue to be implemented as funding permits according to the Spokane RMP Record of Decision of May 1987. Consequently, the description and analyses of alternatives for the RMP amendment will focus primarily on the three issues and administrative changes presented in Chapter 1.

The three issues are: (1) Oil and Gas Leasing and Development, (2) Areas of Critical Environmental Concern, and (3) Off-Road Vehicle Designations.

The Interdisciplinary Planning Team developed two alternatives to analyze these issues: Alternative 1 - Standard Lease Terms and Conditions/Existing RMP; and Alternative 2 - The Amended Plan.

Management Guidance Common to the Alternatives

Oil and Gas Leasing and Operations

Conditions of Approval (COA)

COAs are conditions or provisions routinely required as part of the review and approval process for operations, such as an Application for a Permit to Drill (APD), a Notice of Intent to conduct exploratory operations (NOI), associated rights of way, and other activities. These measures would be applied by the Authorized Officer as appropriate on a case-by-case basis. Note that not all COAs would apply to every field operation; only those needed in a particular case would be used. COAs could be modified or created to meet specific needs, but the protection level determined necessary in these COAs would be maintained. (see Appendix A, Conditions of Approval).

The COA measures are not considered to interfere with lease rights. COAs are enforced at the time operations are proposed under the authority of the regulations and lease terms (see section 6 of the lease form, Appendix B, and 43 CFR 3101.1-2). No lease stipulation is required to ensure mitigation where the timing of operations is limited by 60 days or less during any twelve-month period, or the location of the activities is moved 200 meters or less within the leasehold. However, individual or cumulative timing limitations to protect seasonal resource uses or values that result in a closure of the lease exceeding 60 calendar days, may interfere with lease rights. As a matter of policy, the BLM develops lease timing stipulations identifying known timing conflicts which exceed 60 days and the approximate duration of the timing restrictions. If a COA is used as mitigation for certain resources such as wildlife limitations, a lease notice may be used to identify such known restrictions at the time of lease issuance.

Reasonable Foreseeable Development (RFD)

The RFD scenario is a projection of the magnitude and extent of activities likely to occur in areas open to leasing and development. The projections are based on historical trends, U.S. Geological Survey (USGS) estimates, present activities, and professional judgement. The RFD scenario was utilized to determine the direct, indirect, and cumulative impacts described in Chapter 4, Environmental Consequences.

Based on past exploration and development history within the planning area, it is estimated that an average of about 20 seismic lines would occur annually over the life of the RMP. In addition, about ten exploratory ("wildcat") wells may be drilled during the next 15 years. The success rate of finding hydrocarbons in commercial quantities is expected to be poor, no greater than ten percent, because the Columbia Basin is a frontier exploration area where relatively little resource information is available. Drilling is expected to be limited to those areas rated as having "high" to "moderate" potential.

If one of the ten exploratory wells encounters commercial gas, development of a new field could begin within the life of the RMP. Should a new field be discovered, the target size is expected to be between 3,000 and 25,000 acres, based on the potential size of geologic traps.

Development wells would be drilled in any new field on a spacing pattern determined by the characteristics of the hydrocarbon reservoir. This analysis would use the typical State spacing requirement of one well per 640 acres for a gas field. This would equate to 5 to 39 wells for the potential field size. The projections identified in Table 2-1 were developed using these assumptions, and information from the typical disturbance associated with exploration and development. (See also Appendix C, Fluid Mineral Operations, for additional information regarding Oil and Gas leasing and development.)

Table 2-1. Reasonable Forseeable Projections

Leasing

- Acreage leased per year between 250,000 to 1.4 million acres.
- Minimum federal rentals of $1.50 per acre per year.
- Potential for bonus bids and higher rentals on competitive leases.
- Minimum range of federal revenues between $375,000 to $2.1 million per year.
- Potential minimum federal revenues of $5,625,000 to $31,500,000 ($5.6 to $31.5 million) over 15-year period.

Geophysical Lines

- 300 seismic lines in 15 years (20 per year).
- Each line would require a trail about 12 feet wide and 20 miles long.
- 80% or more of the activity would be on existing road rights-of-way or agricultural lands which have been previously disturbed.
  - Total of about 30 acres per line, or 6 acres new disturbance.
  - Total of about 600 acres per year, or 120 acres new disturbance.
  - Total of about 9000 acres in 15 years, or 1,800 acres new disturbance.
- 80% of the activity would occur on private or state lands.
  - Total of about 20 to 30 acres of new disturbance per year on public land..
  - Total of about 90 to 100 acres new disturbance per year on private and state land.
  - About 300 to 400 acres of new disturbance on federal lands over life of RMP.
  - About 1,400 to 1500 acres of new disturbance on private and state lands over 15 years.
- Expenditures of $8,000 to $12,000 per mile, averaging 20 miles of line per month.
- Range of $3.2 million to $4.8 million per year possible expenditures.
- Between $48 million to $72 million potential expenditures over the 15-year period.

Exploratory Wells

- Ten wells in a 15-year period (life of RMP).
- Well site would cover 5 acres.
- Roads.
  - Surface 18 to 20 feet wide.
  - Considering ditches, etc., total surface about 40 feet.
  - Length of road about 0.5 miles per well.
  - Total of 1 to 4 acres disturbed by roads per well.
- Total surface disturbance per exploratory well is an estimated average of acres.
- Total surface disturbance over 15-year period (life of RMP) would be 70 acres.
- Up to 60% of operations on federal land.
  - Federal surface disturbance of up to 40 acres.
  - Private and state surface disturbance of 30 or more acres.
- Normal drilling times of 6 to 12 months per site.
- Cost would be $12 million or more per well, or $120 million over 15-year period.

Field Development

- Assume size of field ranges from 3,000 to 25,000 acres.
- Assume 640-acre spacing of wells (one well per section).
- Total predicted number of wells would be 5 to 39.
  - Well site would cover 5 acres.
  - All development facilities would be on the well site.
- Assume existing roads used in most cases.
  - Average of 0.5 miles new road per well, with flowlines placed along roadways, on about 1 to 2 acres.

Table 2-1. Reasonable Forseeable Projections (continued)

- Total of 6 to 7 acres per well disturbed by roads, flowlines, and other facilities.
- Total surface disturbance from well developments estimated at 30 to 270 acres.
- Assume a maximum of 60% federal ownership.
  - Disturbance of federal lands estimated at 20 to 160 acres.
  - Disturbance of private and state lands estimated at 20 to 130 acres.
- Minimum field development costs range from $60 million to $468 million, at $12 million per well site.
- Assume up to 50 miles of pipeline construction to connect field to distribution system, at a cost of $200,000 per mile.
- Maximum expenditure for pipeline construction estimated at $10 million.

Total Anticipated Disturbance

- Maximum of about 1,850 to 2,100 acres new surface disturbance over 15-year period.
  - 410 to 580 acres would be maximum range for new federal surface disturbance.
  - 1,440 to 1,550 acres would be maximum range for new private and state surface disturbance.
- Economics
  - Possible range of $174 million with no discoveries, to $701 million with field development influx to Washington from expenditures for operations and federal lease rentals (no estimate on private lease rentals).
  - Assume production does not commence within 15-year period, so no estimate of royalties or gross value of production.

Administrative Changes

Administrative changes being proposed involve combining 9 of the district's 13 management areas (MAs) into four, and establishing two additional management areas. No boundary changes are being proposed for four management areas (Badger Slope, Juniper Forest, Rock Creek, and Saddle Mountains). The Similkameen and Conconully MA would be combined and renamed the Okanogan MA; North Ferry, North Stevens, and Huckleberry Mountains MA would be combined and renamed the Northeast MA; Douglas Creek and Jameson Lake MA would be combined and renamed Moses Coulee MA. These areas are proposed for consolidation because of their proximity to one another and because the program emphasis of the areas being combined have become so similar. Similarity of program emphasis is also the reason for recommending that Rattlesnake Hills MA become part of the Scattered Tracts MA. Actions identified for these management areas in the Spokane RMP/ROD would continue to be implemented for the reconfigured MAs, subject to any modifications of this plan amendment. The two additional management areas that would be established are the Yakima River Canyon (YRC) and Upper Crab Creek. Management guidance specific to these two new MAs is identified below. (See Table 2-2 for program emphasis summary and see Map 1 for revised MA boundaries being proposed.)

Proposed MAs - Yakima River Canyon and Upper Crab Creek

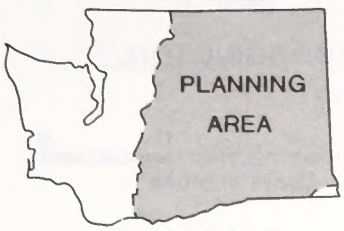
The Yakima River Canyon MA would consist of the public lands identified on Map 2. The Recreation Management Plan for this area, approved December 1988, would continue to be implemented.

The Upper Crab Creek MA would consist of public lands identified within the boundaries shown on Map 3. The management goal for this area is to enhance native riparian and sagebrush steppe habitat, enhance opportunities for wildlife-based recreation, and identify and protect significant cultural values.

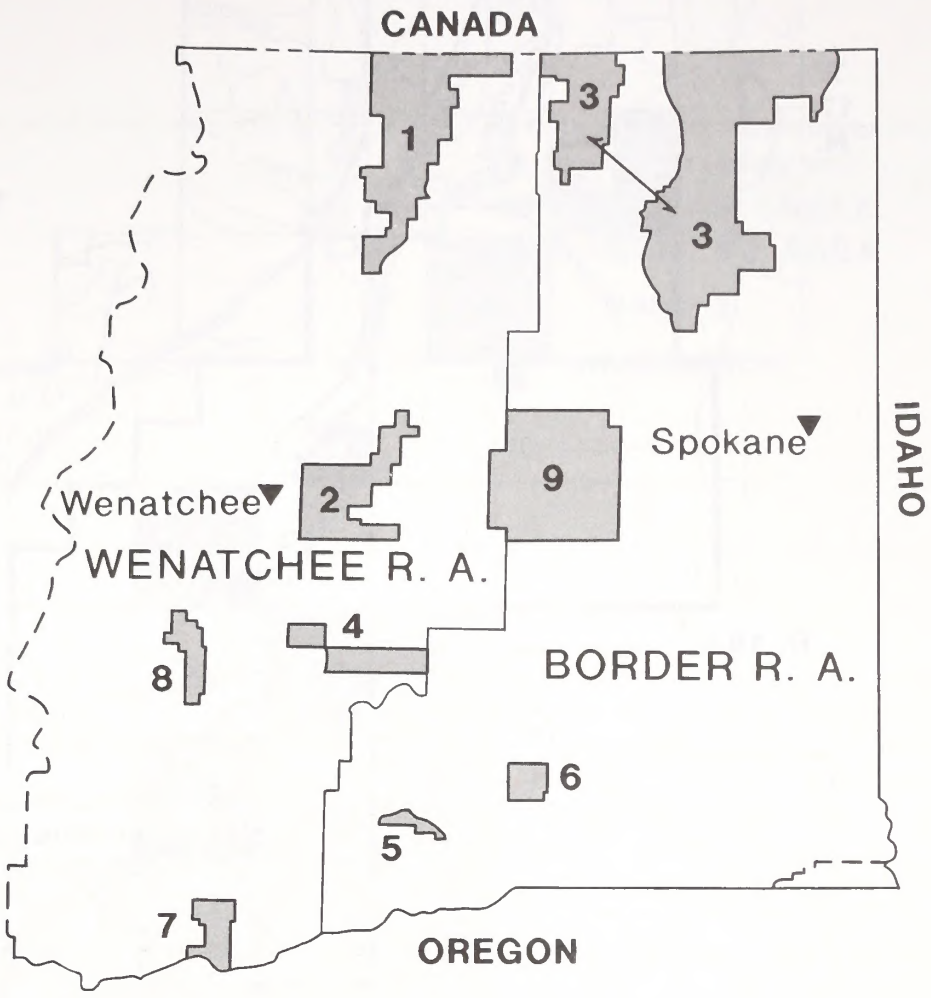
Specific parcels within the Upper Crab Creek MA that have the potential to support diverse riparian associations, wildlife habitat, threatened or endangered species habitat, special recreation areas, and/or significant cultural resources, may be identified for special management. This may include the restoration of riparian and upland plant communities, including threatened or endangered plant communities; develop-

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BUREAU OF LAND MANAGEMENT

MANAGEMENT AREAS
MAP 1



WASHINGTON
(Spokane District)

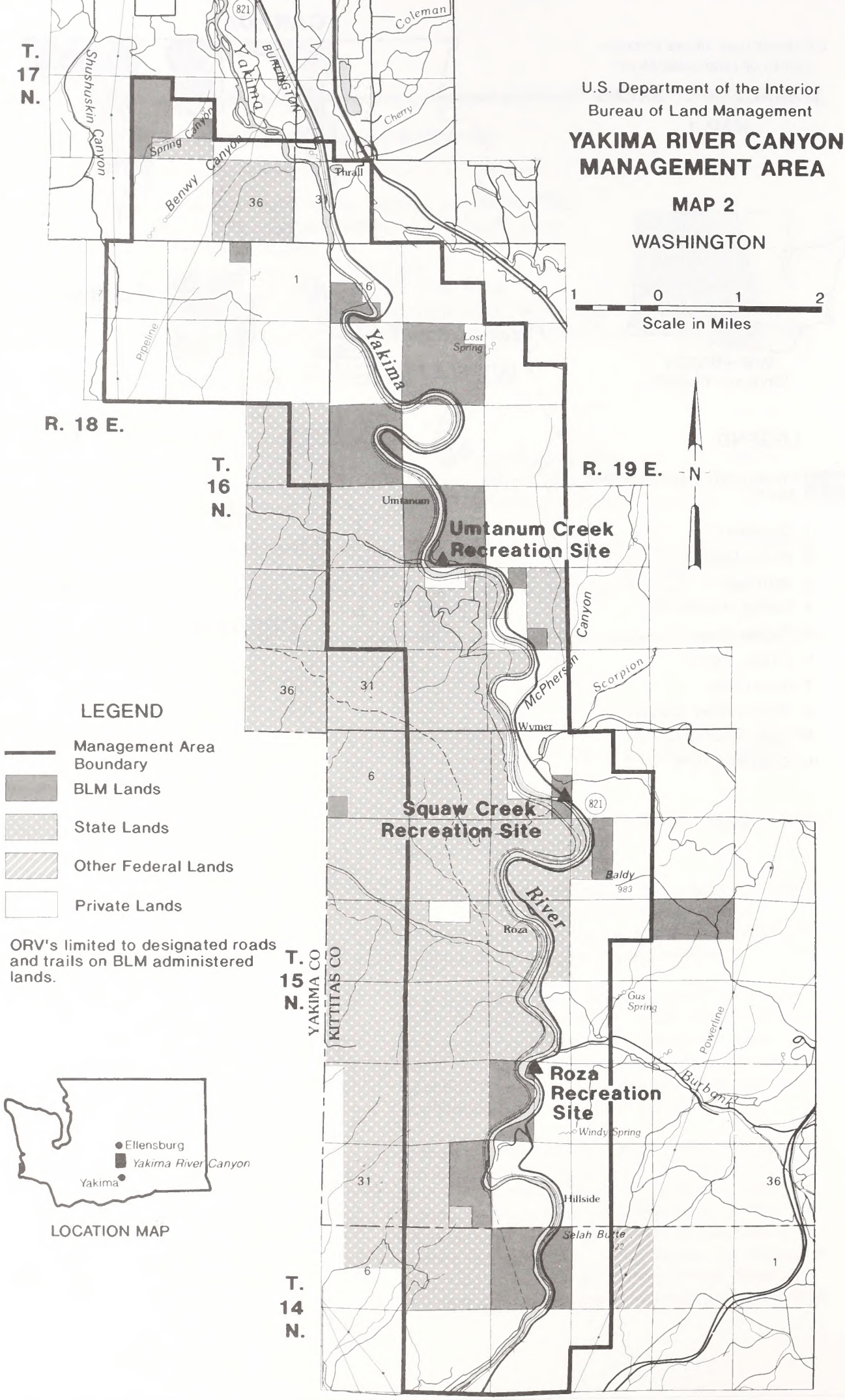


LEGEND

PROPOSED MANAGEMENT AREAS

1. Okanogan
2. Moses Coulee
3. Northeast
4. Saddle Mountains
5. Badger Slope
6. Juniper Forest
7. Rock Creek
8. Yakima River Canyon
9. Upper Crab Creek
10. Scattered Tracts

1991


U.S. Department of the Interior
Bureau of Land Management
YAKIMA RIVER CANYON MANAGEMENT AREA
MAP 2
WASHINGTON
1 0 1 2
Scale in Miles
N
T. 17 N.
R. 18 E.
R. 19 E.
T. 16 N.
T. 15 N.
T. 14 N.
YAKIMA CO
KITTITAS CO
Shushuskin Canyon
Spring Canyon
Benwy Canyon
Pipeline
Yakima
BURLINGTON
Coleman
Cherry
Phrall
Lost Spring
Umtanum
Umtanum Creek Recreation Site
McPherson Canyon
Scorpion
Wymer
Squaw Creek Recreation Site
Baldy
983
River
Roza
Gus Spring
Powerline
Roza Recreation Site
Windy Spring
Burbank
Hillside
Selah Butte
821
LEGEND
Management Area Boundary
BLM Lands
State Lands
Other Federal Lands
Private Lands
ORV's limited to designated roads and trails on BLM administered lands.
Ellensburg
Yakima River Canyon
Yakima
LOCATION MAP

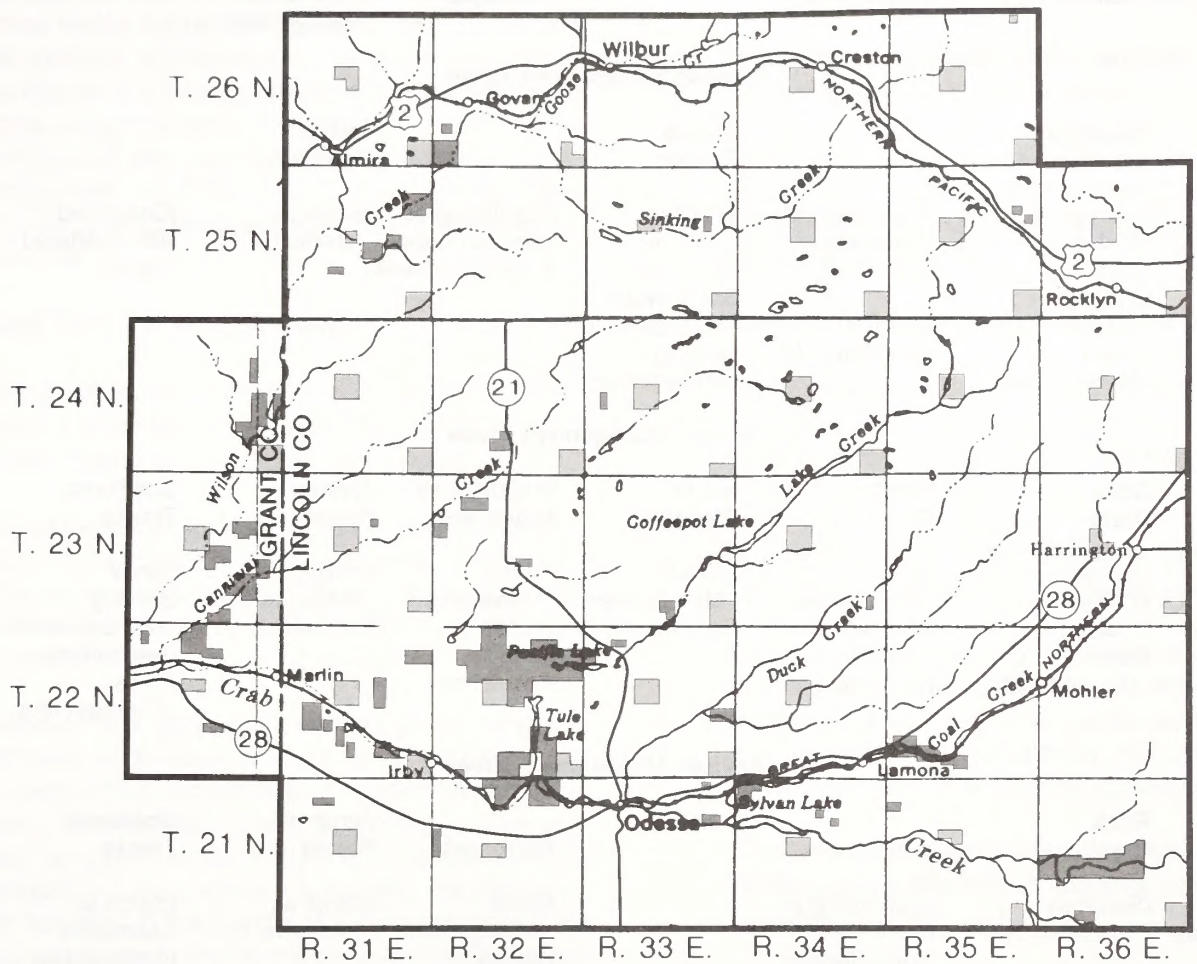
U. S. Department of the Interior
Bureau of Land Management

UPPER CRAB CREEK MANAGEMENT AREA

MAP 3

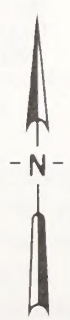
WASHINGTON

5 0 5 10
Scale in Miles





LOCATION MAP



LEGEND

- BLM Lands
- State Lands
- Private Lands

ORV's limited to designated roads and trails on BLM administered lands.

Table 2-2. Program Emphasis by Management Area

			Current Management Areas			
	Similkameen	**Conconully**	**Jameson Lake**	**Douglas Creek**	**Saddle Mountains**	**Rattlesnake Hills**
Alternative 1 Existing Plan	Grazing Management Recreation Forest Management Wildlife Habitat	Wildlife Habitat Grazing Management Recreation Forest Management	Wildlife Habitat Grazing Management Recreation	Grazing Management Recreation Wildlife Habitat Soil & Water Management	Minerals Grazing Management Recreation Wildlife Habitat Soil & Water Management	Grazing Management Recreation Wildlife Wildlife Habitat
			Revised Management Areas			
	Okanogan		**Moses Coulee**		**Saddle Mountain**	
Alternative 2 Amended Plan	Recreation Wildlife Habitat Grazing Management Forest Management	(Combining of Similkameen Conconully) form the Okanogan MA	Wildlife Habitat Recreation Soil & Water Management Grazing Management	(Combining pf Jameson Lake & Douglas Creek)	(Same as Alternative 1)	(Combined with Scattered Tracts)
			Current Management Areas			
	Rock Creek	**North Ferry**	**North Stevens**	**Huckleberry Mountains**	**Juniper Forest**	**Scattered Tracts**
Alternative 1 Existing Plan	Recreation Wildlife Habitat Forest Management	Forest Management Wildlife Habitat Recreation	Forest Management Recreation	Forest Management Wildlife Habitat Recreation	Grazing Management Recreation	Lands Grazing Management Recreation Forest Management
			Revised Management Areas			
	Rock Creek			**Northeast**	**Juniper Forest**	**Scattered Tracts**
Alternative 2 Amended Plan	(Same as Alternative 1)	(Combining of North Ferry, North Stevens, & Huckleberry Mountains)		Forest Management Wildlife Habitat Recreation Grazing Management	(Same as Alternative 1)	(Same as Alternative Incorporates Rattlesnake Hills)
	Yakima River Canyon	**Upper Crab Creek**				
	Recreation Wildlife Habitat	Wildlife Habitat Grazing Management Recreation				

ment and improvement of wetland and riparian habitats; development and improvement of fish habitat; weed control activities; intensive livestock management; and possible development of recreational sites.

Both the Yakima River Canyon and Upper Crab Creek MAs would be managed under multiple use guidelines compatible with plant and animal habitat management goals.

Land exchange and other acquisition opportunities for both the YRC and Upper Crab Creek MAs would be pursued that would emphasize consolidation of public land ownership, complement the recreation opportunities, and enhance threatened and endangered species habitat and/or important riparian values. Cooperative management agreements would be pursued with other agencies and private landowners with emphasis on coordinating recreation management. These agreements would also provide opportunities to enhance management of wildlife habitat, grazing lands, threatened and endangered species habitat, and cultural resources.

Land Tenure Adjustment

Because of the administrative changes being proposed, a summary of the Land Tenure Adjustment and Access Programs is included in this section.

Most of the public land within the ten management areas would remain in public ownership and continue to be administered by the BLM. Any transfer of public lands to other public land management agencies would be evaluated on an individual case basis.

Generally, any lands acquired through exchange, purchase, or donation or lands which have been returned to BLM administration (from other federal agency administration) through withdrawal review, would be placed under the guidance specified for the management area where it is located. For instance, land acquired in the Saddle Mountains Management Area would generally be managed for livestock grazing, recreation, and wildlife habitat. There may, however, be some exceptions where a parcel may be acquired for a specific purpose in which case its management would then be specified in the environmental assessment addressing the acquisition.

Additional criteria that would be used in categorizing public land for either retention or disposal, as well as identifying acquisition opportunities and priorities, are summarized below. While not all inclusive, this list represents the major factors that would be evaluated:

* Public resource values that would benefit and enhance the range management, wildlife habitat, watershed, recreation, forestry, mineral, cultural resource, endangered, threatened, or sensitive plant and animal, and wilderness programs;
* Legal as well as physical accessibility of the land for public use;
* Amount of public monetary investments in facilities or improvements on the public land and the potential for recovering those investments;
* Difficulty or costs in time and money in the effective managerial administration of the lands;
* Suitability or desirability of the land for management by another governmental agency;
* Significance of any subsequent land use decisions in stabilizing, enhancing, or hindering existing or potential businesses, social and economic conditions, and/or life-styles;
* Need for future mineral or energy development;
* Encumbrances to the land, including, but not limited to, Recreation and Public Purposes and small tract leases and/or other leases and permits, rights-of-way, and withdrawals;
* Consistency of the decision with cooperative agreements and plans or policies of other agencies;
* Suitability and need for change in land ownership or use for purposes including, but not limited to, community expansion or economic development, such as residential, commercial, industrial, or agricultural (other that grazing) development; and
* State and local governmental requests and recommendations for retention or disposal of BLM administered public land.

Land Exchanges

Exchanges of public land will continue under Section 206 of FLPMA which requires:

1. A determination that the public interest will be well served by making an exchange;
2. Lands to be exchanged are located in the same state; and
3. Exchanges must be for equal value but differences can be equalized by payment of money by either party.

The highest land tenure adjustment priority would be placed on consolidation of public lands through land exchanges and prchases into, between and within the ten management areas identified in this RMP Amendment. Most of the public land within these ten management areas would remain in public ownership and continue to be administered by the BLM. Public lands designated as wilderness, wilderness study area, or areas of critical environmental concern would be retained.

Exchanges would be accomplished to acquire specific tracts that: provide greater expanses of uninterrupted high value wildlife habitats, possess recreational values that can be better managed and/or developed in public ownership, provide legal access to other public lands, qualify as an ACEC, have high scenic values, enhance the value/manageability of other public land, or possess other resource values of public interest that would be devalued or lost if retained in private ownership.

Prior to the exchange of any public land, on-the-ground inventories are conducted and an environmental analysis prepared with opportunity for public review and comment. If any significant resources (such as threatened or endangered species, unique habitats, or important cultural resources) are found as a result of these inventories and environmental analysis, and their retention determined to be in the public's interest, then areas supporting such resources would be excluded from the exchange and managed accordingly.

Disposals of lands under the agricultural land laws or sale under Section 203 of FLPMA will not be made until the following alternatives have been examined and found not feasible:

* Exchanges which would benefit the Bureau's multiple use management mission.

* Conveyances under the Recreation and Public Purposes Act to meet the needs of certain state and local governmental agencies and other qualified organizations.

* Transfers to other Federal agencies by land withdrawals.

Alternative 1 - Standard Lease Terms and Conditions/ Existing RMP

Alternative 1 is essentially the no action alternative. This alternative consists of continued implementation of the RMP without allowing for adjustments in land management decisions (i.e., ORV designations and additional ACEC proposals) based on new information or policy changes. Reconfiguration of management areas is included in this alternative.

Oil and Gas Leasing and Development

The Standard Lease Terms and Conditions referenced in Alternative 1 are required by law and regulation for oil and gas leasing and, as such, are attached to every oil and gas lease regardless of other considerations. (See Appendix B for Standard Lease Terms and Conditions.) Alternative 1, being the most simplistic alternative that can reasonably be analyzed, is potentially the least restrictive leasing program the BLM would legally be permitted to implement.

Under Alternative 1, approximately 1.11 million acres of public land and subsurface mineral estate would be open to leasing subject to Standard Lease Terms and Conditions. On Table 2-3 are more detailed descriptions of these acreages and leasing categories, and on Map 1 are the approximate locations of respective leasing categories to be applied.

Areas of Critical Environmental Concern

The 12 currently designated ACECs would continue to be managed to preclude land uses that could potentially damage special resource values. Table 2-4 provides a summary of the existing ACECs and their special resource values.

Off Road Vehicle Designations

ORV designations would remain as described in the 1987 RMP Spokane District Record of Decision (see Table 2-5). All 21,000 acres of land acquired since completion of the RMP would remain open to ORV use.

Table 2-3. Existing Plan - Individual Types of Restrictions on Lands by Agency

	Availability of Lands (in acres) for Fluid Mineral Leasing			
	High Potential	Moderate Potential	Low Potential	Total
Open Subject to Standard Lease Terms and Conditions				
Split Estate (BLM/USBR)	664,000	9,000	33,000	706,000
BLM fee estate	133,000	39,000	141,000	313,000
USBR fee estate	104,000	0	80	104,080
Dept. of Defense				
(Yakima Firing Center	0	0	0	0
(US Army Corps of Eng).	0	0	0	0
Open Subject to Seasonal or Other Constraints				
Timing Limitations Stipulations				
Split Estate (BLM/USBR)	0	1,000	1,400	2,400
BLM fee Estate	0	0	0	0
USBR fee estate	0	0	0	0
Dept. of Defense				
((Yakima Firing Center)	225,000	0	0	225,000
(US Army Corps. of Eng.)	0	0	0	0
Controlled Surface Use Stipulations				
Split Estate (BLM/USBR)	0	0	0	0
BLM fee estate	3,000	1,400	0	4,400
USBR fee estate	0	0	0	0
Dept. of Defense				
(Yakima Firing Center)	225,000	0	0	225,000
(US Army Corps. of Eng.)	7,000	0	0	7,000
No Surface Occupancy Stipulations				
Split Estate (BLM/USBR)				0
BLM fee estate	600	0	80	680
USBR fee estate	0	0	0	0
Dept. of Defense				
(Yakima Firing Center	0	0	0	0
(US Army Corps. of Eng.)	7,000	0	0	7,000
Special Administration Stipulations				
Split Estate (BLM/USBR)	0	0	0	0
BLM fee estate	0	0	0	0
USBR fee estate	0	0	0	
Dept. of Defense				
(Yakima Firing Center	225,000	0	0	225,000
(US Army Corps. of Eng.)	7,000	0	0	7,000
Closed to Leasing				
No Leasing (Discretionary)				
BLM fee estate	7,000	0	5,000	12,000
BLM surface only	0	0	0	0
Dept. of Energy	365,000	0	0	365,000
USFWS fee estate	30,000	0	15,000	45,000
Dept. of Defence (YFC)	36,000	0	0	36,000

Table 2-4. Areas of Critical Environmental Concern

Area Name	Value	County Located	Acres
	Existing Areas of Critical Environmental Concern		
Hot Lakes	Merimictic Lake	Okanogan	80
Brewster Roost	Bald Eagle Winter Roost	Douglas	200
Colockum Creek	Federal Candidate Species	Chelan	80
Rock Island Canyon	5 Federal Candidate Species	Douglas	1,200
Yakima River Cliffs & Umtanum Ridge	Federal Candidate Species	Yakima, Kittitas	320
McCoy Canyon	2 Federal Candidate Species	Benton	100
Earthquake Point	Federal Candidate Species	Chelan	40
Roosevelt[1]	Federal Candidate Species	Klickitat	80
Sentinel Slope	Federal Candidate Species	Grant	200
Webber Canyon[1]	Paleontologic Resources	Benton	40
Yakima and Columbia River Islands	Crucial Nesting Habitat	Benton, Franklin	640
Juniper Forest	Nesting Habitat	Franklin	5,540
Proposed ACECs			
Coal Creek	Federal Candidate Species Important Riparian Habitat Cultural Values	Lincoln	710
Cowiche Canyon	Federal Candidate Species Recreation Values	Yakima	560
Little Vulcan Mountain	Federal Candidate Specie Important Wildlife Habitat	Ferry	600
Yakima River Canyon	Federal Candidate Species Important Wildlife Habitat Recreation Values Cultural Values	Kittitas, Yakima	4200
Total[2]			**14,470**

[1]Under Alternative 2 (The Amended Plan) the ACEC designations for these two areas would be revoked, and the public land involved would be returned to multiple use.

[2]Total does not include acreage of Roosevelt and Webber Canyon ACECs.

Table 2-5. Existing and Proposed ORV Designations (Figures given in acres)

Management Area	Open		Seasonally Restricted to Designated Roads and Trails		Permanently Restricted to Designated Roads and Trails		Permanently Closed	
	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed
Wenatchee Resource Area								
Moses Coulee	15320	15320	5040	5040	7440	7440	0	0
Okanogan	30394	26694	3940	3940	5828	9528	5598	5598
Rock Creek	0	0	0	0	6400	6400	0	0
Saddle Mountains	10710	6870	0	0	20000	23840	0	0
Yakima River Canyon	4200	0	0	0	0	4200	0	0
Scattered Tracts	104299	104973	0	0	0	0	0	0
Subtotal	**164923**	**153857**	**8980**	**8980**	**39668**	**51408**	**5598**	**5598**
Border Resource Area								
Badger Slope	0	0	0	0	7700	7700	40	40
Juniper Forest	5200	3920	0	0	7340	8620	7140	7140
Northeast	39536	39536	0	0	0	0	0	0
Upper Crab Creek	16263	0	0	0	0	16263	0	0
Scattered Tracts	19972	24298	0	0	0	0	640	640
Subtotal	**85971**	**67754**	**0**	**0**	**15040**	**32583**	**7820**	**7820**
Total for Planning Area	**250894**	**221611**	**8980**	**8980**	**54708**	**83991**	**13418**	**13418**

Alternative 2 - The Amended Plan

Alternative 2 addresses BLM's revised guidelines for fluid mineral leasing and development, and also new prescriptions (i.e., ORV designations and additional ACEC nominations) derived from recommendations of BLM staff and the general public.

Oil and Gas Leasing and Development

Under Alternative 2, oil and gas resources would be leased with Standard Terms and Conditions as well as additional leasing stipulations to protect other resources and values. (See Appendix D and Table 2-6). (Note that new stipulations cannot be attached to existing leases without the consent of the lessee. However, after the existing leases expire, the new stipulations may be included in any new leases that are issued.) The new stipulations are derived from two sources: the existing stipulations (Appendix B, Standard Lease Terms and Conditions), and stipulations developed during this plan amendment process.

The RMP includes mineral resources of lands managed by other surface management agencies. Therefore, any leasing recommendations made by BLM must take into consideration the missions of these agencies, their policies and restrictions on oil and gas activities, existing withdrawals, and limits imposed by regulations and Congress.

Some federal lands within the Hanford Reservation and the Yakima Firing Center are closed to leasing, while other lands within these two areas are technically open to leasing. However, the surface managing agencies in these specific areas generally prohibit leasing and exploration, or may invoke highly restrictive limitations on such activities.

Lands administered by the U.S. Fish & Wildlife Service are closed to leasing, exploration and development, unless oil and gas resources on their lands are being extracted by development of adjacent lands. BLM designated wilderness areas and wilderness study areas are also closed to leasing. Corps of Engineers and Bureau of Reclamation withdrawals for dam sites typically include restrictions on operations conducted in the vicinity of dams and reservoirs.

Table 2-6. - Cumulative and Individual Types of Restrictions by Agency on Lands According to Relative Mineral Potentials

2-6A

Restrictions	Cumulative Restrictions Availability of Lands by Mineral Potential (Acres)			
	High	Moderate	Low	Total
No Leasing				
Dept. of Energy, USFWS, Wilderness, & Wilderness Study Areas	402,000	0	2,000	404,000
High				
No Surface Occupancy (RNAs, Reservoirs, etc.) Controlled Surface Use (Dept. of Defense)	32,000	7,000	30,000	69,000
Moderate				
Controlled Surface Use (Multiple Restrictions & Timing limitations greater than 6 months.)	12,1000	5,000	2,000	128,000
Low				
Controlled Surface Use (Timing limitations less than 6 months) Administrative Stipulations (US Bureau of Reclamation) standard Stipulations	891,000	66,000	162,000	1,119,000
Total	**1,446,000**	**78,000**	**196,000**	**1,720,000**

Table 2-6. - Cumulative and Individual Types of Restrictions by Agency on Lands According to Relative Mineral Potentials (continued)

2-6B

Type of Restriction by Agency	Availability of Lands (in Acres) by Mineral Potential			
	High Potential	Moderate Potential	Low Potential	Total
Open Subject to Standard Lease Terms and conditions				
Split Estate (BLM/USBR)	664,000	9,000	33,000	706,000
BLM fee estate	72,000	38,000	101,000	211,000
USBR fee estate	104,000	0	80	104,080
Dept. of Defense				
(Yakima Firing Center)	0	0	0	0
(US Army Corps. of Eng.)	0	0	0	0
Open Subject to Seasonal or Other Constraints				
Timing Limitations Stipulations				
Split Estate (BLM/USBR)	0	1,040	1,400	2,440
BLM fee estate	70,000	14,000	18,000	102,000
USBR fee estate	0	0	0	0
Dept. of Defense				
(Yakima Firing Center)	16,000	0	0	16,000
US Army Corps. of Eng.	0	0	0	0
Controlled Surface Use Stipulations				
Split Estate (BLM/USBR)	0	0	0	0
BLM fee estate	3,000	1,400	0	4,400
USBR fee estate	0	0	0	0
Dept. of Defence				
(Yakima Firing Center)	225,000	0	0	225,000
(US Army Corps. of Eng.)	0	0	0	0
No Surface Occupancy Stipulations				
Split Estate (BLM/USBR)	0	0	0	0
BLM fee estate	600	0	80	680
USBR fee estate	52,000	7,000	31,000	90,000
Dept. of Defense				
(Yakima Firing Center)	0	0	0	
(US Army Corps. of Eng.)	7,000	0	0	7,000

Table 2-6. - Cumulative and Individual Types of Restrictions by Agency on Lands According to Relative Mineral Potentials (continued)

2-6B

Type of Restriction by Agency	Availiability of Lands (In Acres) by Mineral Potential			
	High Potential	Moderate Potential	Low Potential	Total
Special Administration Stipulations				
Split Estate (BLM/USBR)	0	0	0	0
BLM fee estate	0	0	0	0
USBR fee estate	215,000	0	0	215,000
Dept. of Defense				
(Yakima Firing Center)	225,000	0	0	225,000
(US Army Corps. of Eng.)	7,000	0	0	7,000
Closed to Leasing				
No Leasing				
BLM fee estate	7,000	0	5,000	12,000
BLM surface only	0	0	0	0
Dept. of Energy	365,000	0	0	365,000
USFWS fee estate	30,000	0	15,000	45,000

Areas of Critical Environmental Concern

Under this alternative, two ACEC designations would be revoked or rescinded, and four additional areas would be designated. The Webber Canyon ACEC designation would be revoked because both contract paleontologists and district resource specialists, in evaluations subsequent to its designation, indicated there were no significant paleontological resource values at this site. The Roosevelt Slope ACEC designation is the other designation that is being rescinded because the resource value, Astragalus misellus v. pauper (a federal category 2 plant species at the time of this ACEC designation), is no longer listed, and because there are no identified threats to its habitat.

The four areas proposed for ACEC designation under Alternative 2 are Coal Creek, Cowiche Canyon, Little Vulcan Mountain, and Yakima River Canyon. These areas are described below and on Table 2-4. Appendix E includes a description of those areas that were nominated for ACEC Designation but were not carried forward because the interdisciplinary planning team believed that either more information was needed before a recommendation could be made, or that the areas did not meet the BLM's relevance and importance criteria.

Proposed ACEC Designations

Coal Creek

The Coal Creek site is located in Lincoln County, Washington approximately 36 miles west of Spokane, (see Map 5). The area contains approximately 710 acres of public land. The dominant feature is Coal Creek and the associated riparian areas. The area receives approximately 10 to 14 inches of precipitation annually. Native vegetation consists of shrub-steppe

plant community with water birch, cottonwood, willow or aspen scattered in the riparian zones.

The values of this area include a Federal Category 1 proposed T/E plant species (Polemonium pectinatum), important riparian and fish habitat, and cultural values. Polemonium pectinatum is a rare endemic plant restricted to riparian bottom lands within the Crab Creek drainage system.

The primary management objective would be the maintenance or enhancement of the values identified above. This management could include such activities as construction of fences to exclude livestock from sensitive areas and stream bank stabilization projects to enhance riparian areas and fish habitat.

Cowiche Canyon

Cowiche Canyon is located in Yakima County approximately six miles northeast of Yakima, Washington (see Map 5). This area is made up of three separate parcels of public land totaling 560 acres and receives approximately 10 to 15 inches of precipitation annually. Native vegetation consists of a shrub-steppe plant community with water birch, cottonwood, or willow scattered in the riparian zones of Cowiche Creek. The upland area is dominated by shallow soils and rock outcroppings with stiff sage and annual grasses dominating the vegetation.

This area supports Tauschia hooveri, a Federal Category 2 plant species (Federal Register, 1990) proposed for listing as Threatened or Endangered. This species is of national significance, and is rare and irreplaceable. Tauschia hooveri is an endemic species restricted to parts of Yakima and Kittitas Counties. This site contains a large population on flat scabland sites throughout its range. It is also found on more sandy sites in the southern end of its range. The unique nature of the habitat adds to the importance of this site in maintaining diversity.

Cowiche Canyon is also a high recreational day use area. Uses include hiking, horseback riding, ORV riding, and bird watching. Its proximity to Yakima, Washington and the corresponding suburban communities has resulted in increased recreational pressures. Conflicts between recreationists are increasing. This area is also currently leased for livestock grazing.

The primary management objective for ACEC designation of Cowiche Canyon is to ensure the continued existence of Tauschia hooveri without precluding other compatible uses. Initially, ORVs would be limited to designated roads and trails, and Tauschia hooveri populations would be monitored to determine the habitat conditions. Existing recreation activities would be permitted to continue. If monitoring indicates that livestock grazing is directly contributing to the decline of the species, livestock use adjustments would be made.

Little Vulcan Mountain

This area consists of 600 acres of public land and is located approximately six miles west of Curlew, Washington. The combination of elevation, aspect, and rock outcroppings within this vegetative community provide the unique qualities that is conducive to bighorn sheep habitat. This habitat is critical for the continued existence of the local herd. The BLM lands contain the best winter range and escape cover and 50 percent of the lambing area. This area also contains pockets, 5 to 10 acres in size, of old growth south slope ponderosa pine/lodgepole pine-pinegrass vegetative community.

The primary management objective would be maintenance or enhancement of the bighorn sheep habitat. Livestock grazing would be permitted to continue. No range improvement projects would be permitted except for enhancement of sheep habitat, such as the construction of fences to control livestock use.

Yakima River Canyon

The Yakima River Canyon (YRC) is located five miles south of Ellensburg, Washington on the eastern foothills of the Cascade Mountain Range (see Map 2). There are approximately 4,200 acres of public land in the Management Area. Dominant features include a 23-mile meandering segment of the Yakima River, and Manastash and Umtanum Ridges.

The area receives approximately 10 inches of precipitation annually, mostly during the winter and spring months. The native vegetation can be classified as being in the big sagebrush bluebunch wheatgrass habitat type. Ponderosa pine trees are scattered throughout the lower elevations and the bottomland with alder, aspen, dogwood, cottonwood and willows more or less forming a greenbelt along the river's edge. Found within these communities are four special status plant species (Tauschia hooveri, Astragalus columbianus, Erigeron basalticus, and Lomatium tuberosum). The canyon is also important for wildlife habitat. Recent inventories indicated that the YRC compares favorably to the Snake River Birds of Prey Natural Area in terms of density of nesting raptors and variety of species present. In addition to the raptors, over 120 other species have also been observed utilizing the canyon at times throughout the year. In

addition to the avian species, big horn sheep, mule deer, and an occasional elk or bear have also been sited in the canyon.

The area also has historical significance. Research indicated that it was a corridor through which both Native Americans and fur trappers traveled. There is evidence that during prehistoric times, Native Americans used the area anywhere from a few days to extended periods of time.

Livestock grazing is another permitted use. In the YRC, 295 animal unit months (AUMs) of livestock use are authorized on three allotments. These three allotments involve 2,085 acres of the 4,200 acres of federal lands in the canyon.

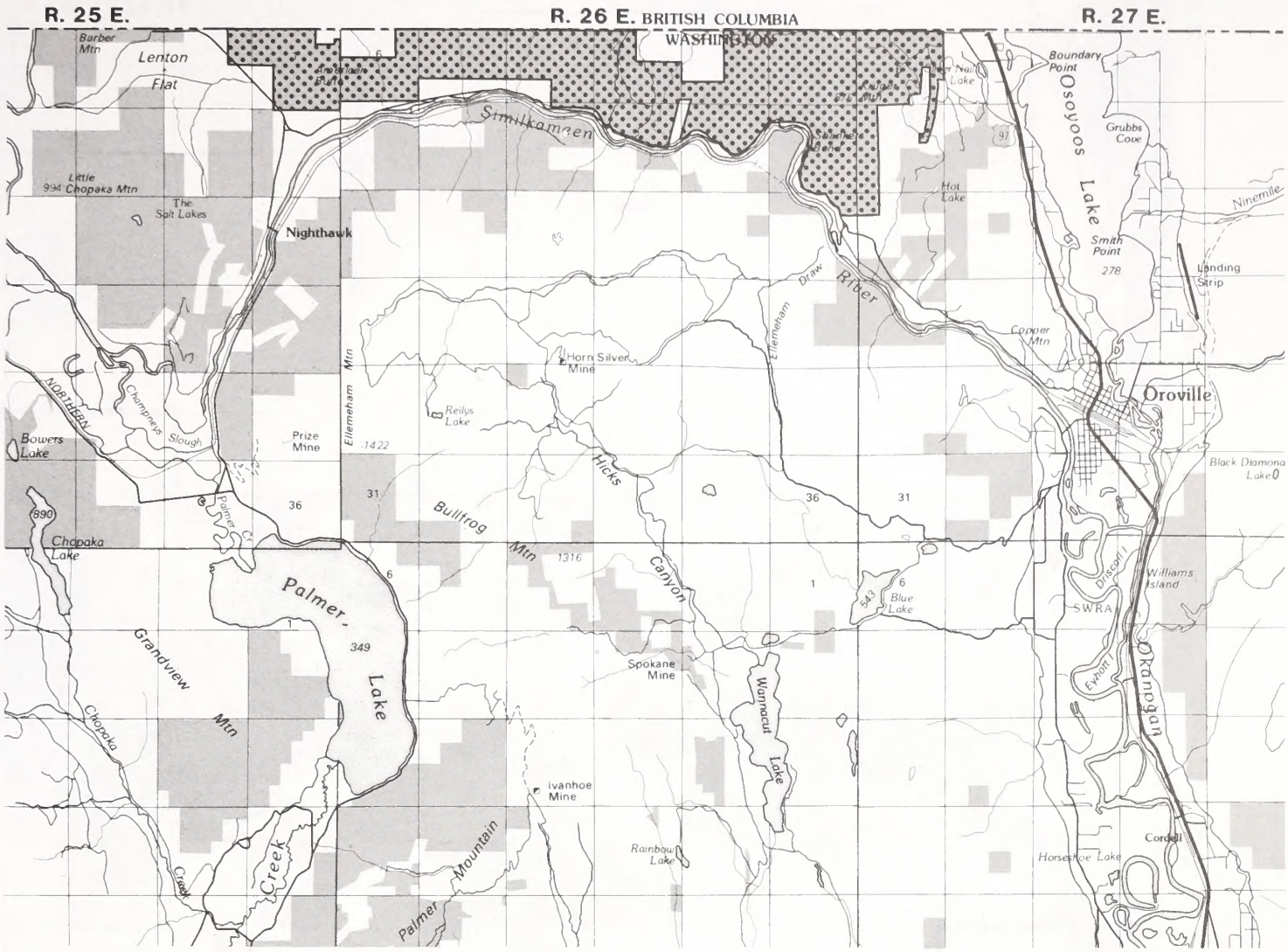
The primary management objectives are to manage the increasing recreational uses that are occurring in the canyon and at the same time maintain or improve sensitive habitat. Initial management actions would include limiting ORVs to designated roads and trails. BLM would continue monitoring the sensitive species habitat and make land use adjustments as necessary.

The Yakima River Canyon Recreation Management Plan would continue to be implemented. (Copies of this plan are available upon request.) See Appendix F for a summary of the specific management actions included in the recreation management plan.

Off Road Vehicle Designations

Most of the ORV designations under Alternative 2 would remain as indicated in the May 1987 Resource Management Plan/Record of Decision. The changes being proposed would affect public lands in the Yakima River Canyon MA (4,200 acres), the public lands north of the Similkameen River in the Okanogan MA. (4,260 acres) and all of the public land in the Upper Crab Creek MA (15,000 acres). ORV use in these areas would be limited to designated roads and trails.

Other ORV designations that would be affected under Alternative 2 include the recently acquired lands in the Moses Coulee, Saddle Mountains, and Juniper Forest Management Areas. The proposed changes in ORV designations are listed on table 2-5 and shown on maps 2, 3, and 6 - 8.



LEGEND

BLM Lands

ORV's Limited to Designated Roads and Trails



N

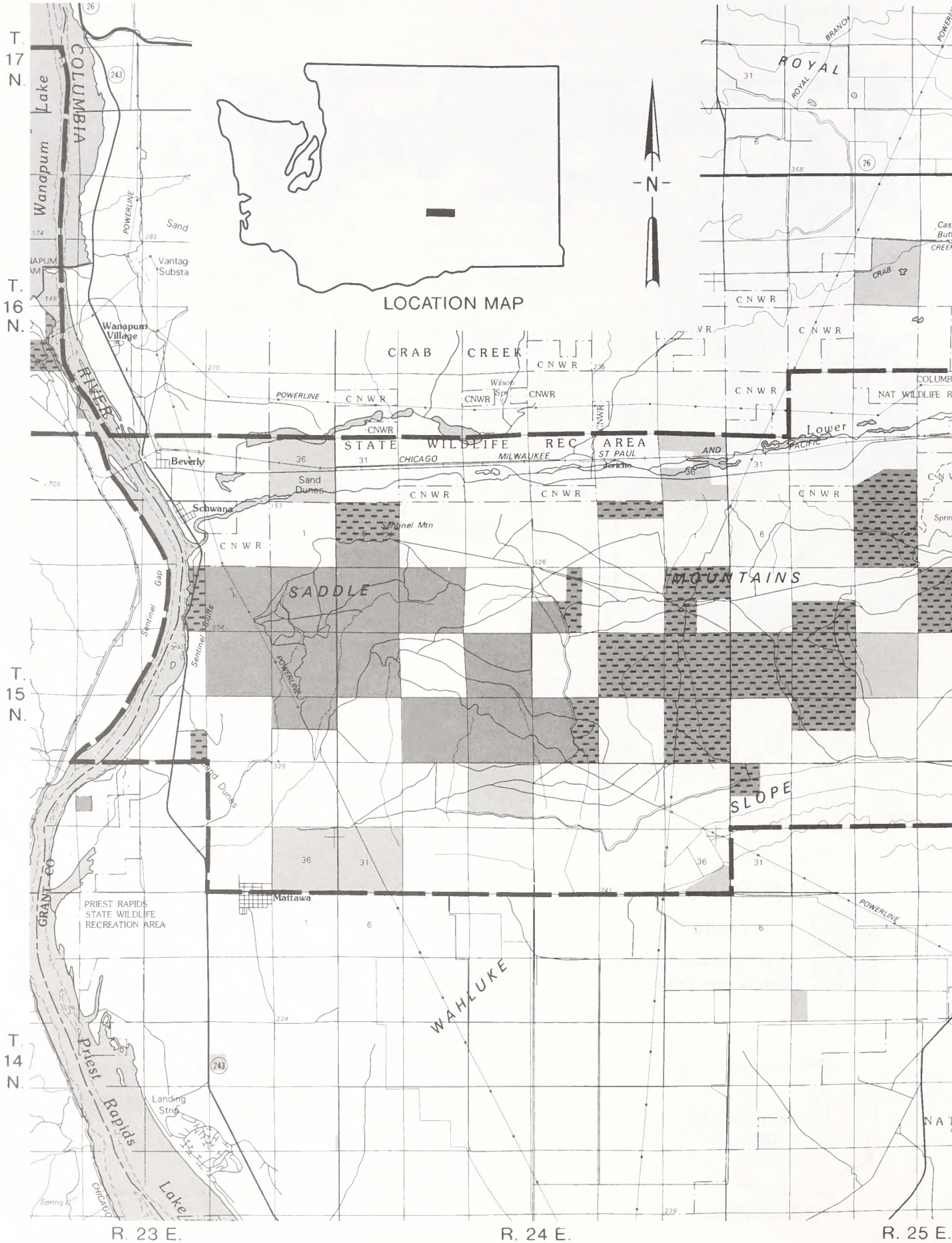
U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

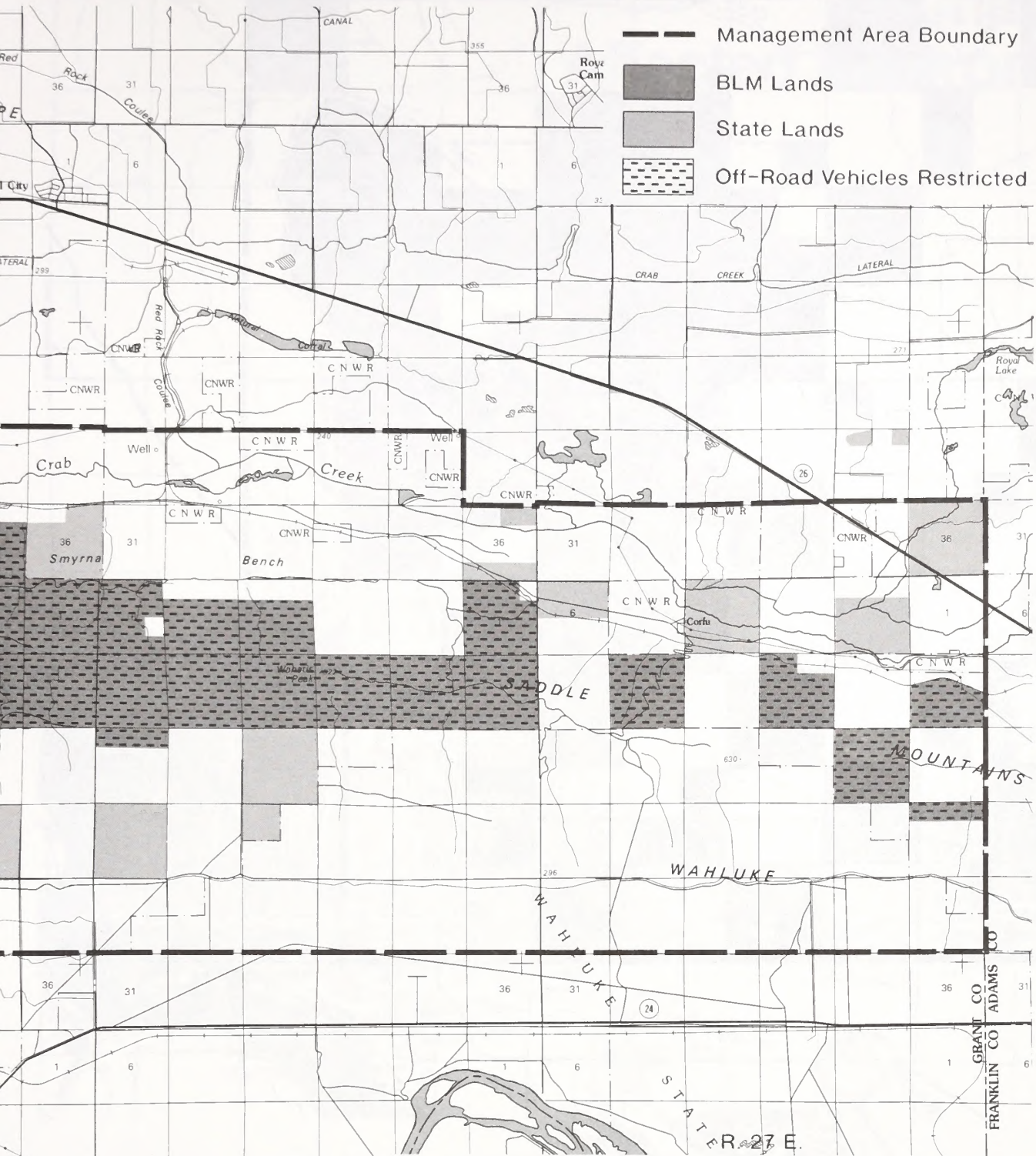
OKANOGAN MANAGEMENT AREA
OFF – ROAD VEHICLE DESIGNATIONS

MAP 6

1 0 1 2
Scale in Miles

1991


T. 17 N.
T. 16 N.
T. 15 N.
T. 14 N.
R. 23 E.
R. 24 E.
R. 25 E.
LOCATION MAP
N
COLUMBIA
Wanapum Lake
RIVER
POWERLINE
Vantage Substa
Wanapum Village
Beverly
Schwana
Sand Dunes
Sentinel Mtn
Sentinel Gap
Sentinel Bluffs
CRAB CREEK
Wilson Spr
CNWR
STATE WILDLIFE REC AREA
CHICAGO MILWAUKEE ST PAUL AND PACIFIC
Jericho
Lower
NAT WILDLIFE R
ROYAL
BRANCH
SADDLE MOUNTAINS
SLOPE
Mattawa
PRIEST RAPIDS STATE WILDLIFE RECREATION AREA
GRANT CO
WAHLUKE
Priest Rapids Lake
Landing Strip
Spring C
CHICAGO



U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

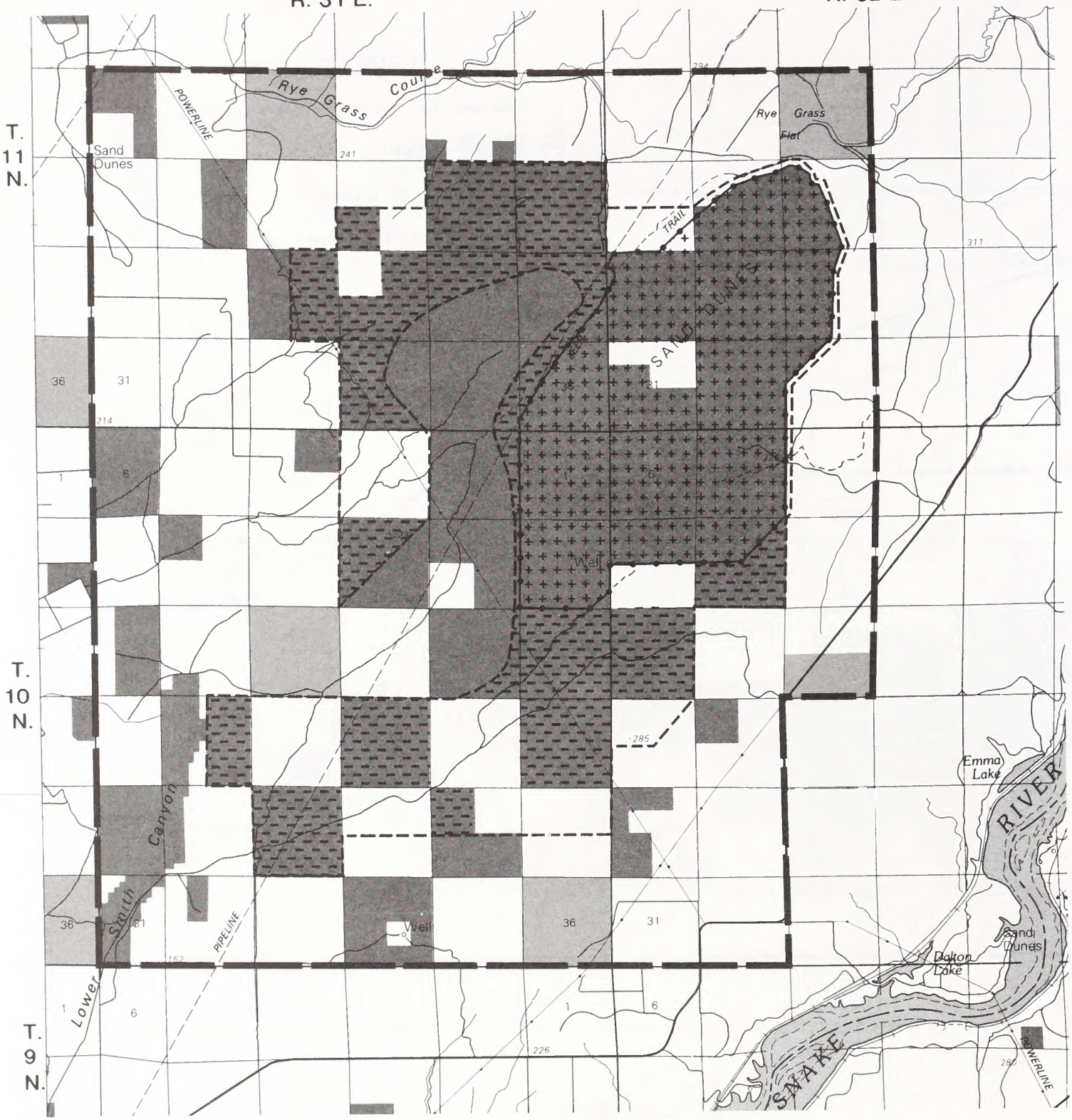
EASTERN SECTION OF SADDLE MOUNTAIN MANAGEMENT AREA

MAP 7

WASHINGTON

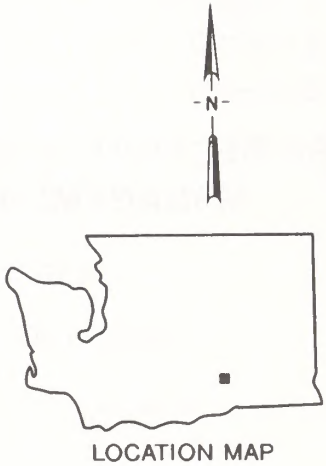
1 0 1 2
Scale in Miles

1991



LEGEND

- Management Area Boundary
- Juniper Forest ACEC
- Juniper Dunes Wilderness
- BLM Lands
- State Lands
- Closed to Off-Road Vehicles
- Off-Road Vehicles Restricted



LOCATION MAP

U.S. Department of the Interior
Bureau of Land Management

JUNIPER FOREST MANAGEMENT AREA

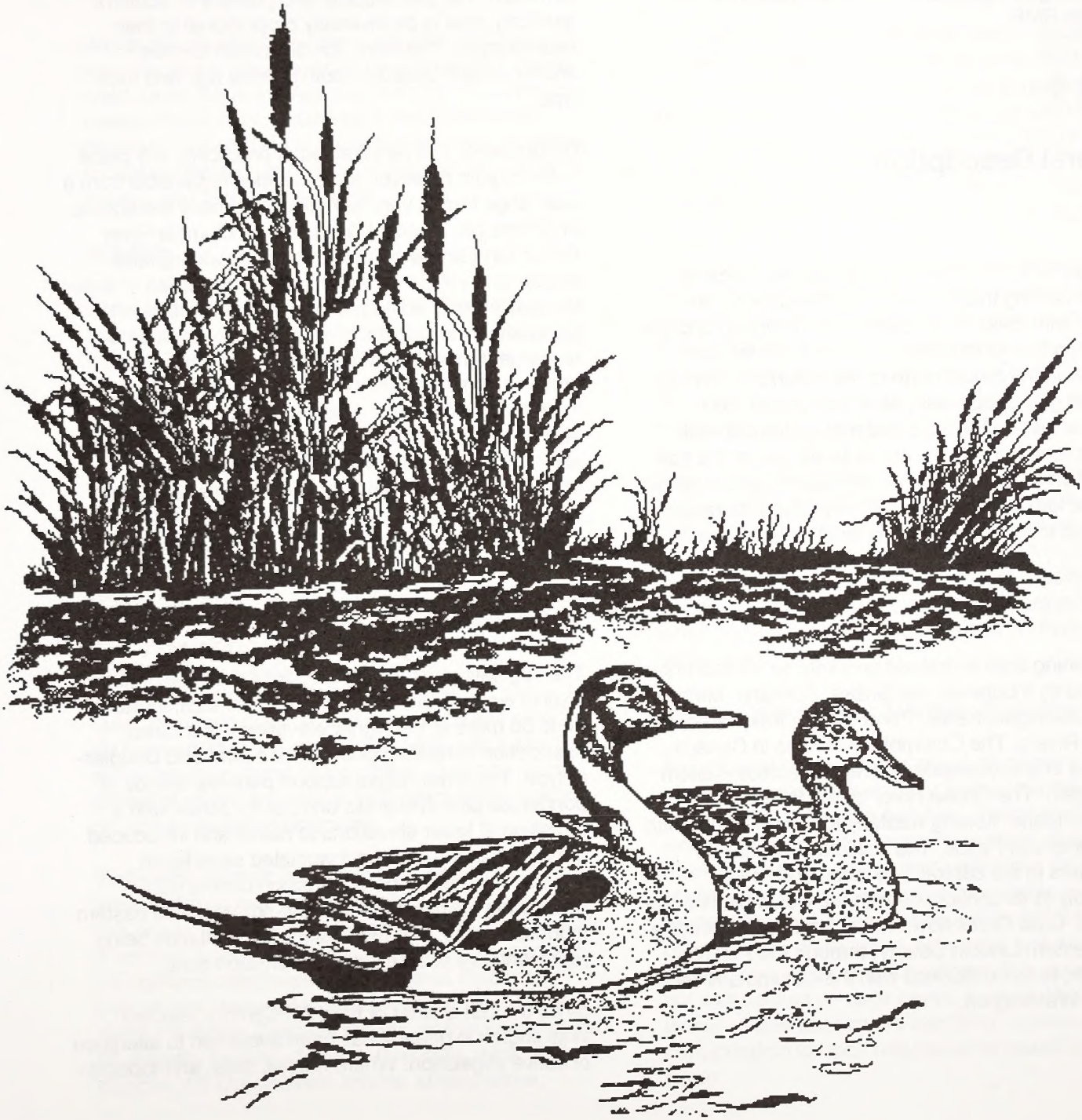
MAP 8

WASHINGTON

1 0 1 2
Scale in Miles

1991

Chapter 3
Affected Environment



Affected Environment

This chapter describes the public lands and federal mineral estate that could be significantly affected by actions proposed in this RMP amendment. The planning area, which essentially covers eastern Washington, has been organized into two parts for the description section. Part 1 provides a general description of the planning area as a whole, and Part 2 provides brief specific descriptions of two areas (the Yakima River Canyon and the Upper Crab Creek drainage) where BLM's management responsibilities have changed significantly since completion of the Spokane RMP.

Part 1

General Description

Soil

Soil material in the planning area overlies volcanic rocks in varying thicknesses. Upland surfaces are covered with loess or windblown sand varying in depth from a few feet to more than 100 feet. Basins and channels in the basalt north of the Columbia River are filled with glacial outwash, sand and gravel, and lacustrine silt. Soil surface material on the outwash areas ranges from sandy loams to silt loams; the soil material on the lake beds are compacted and stratified silts. The loess and other windblown deposits range from sand to silt loams. These deep soils are easily eroded.

Water

The planning area is drained primarily by the Columbia River and its tributaries: the Snake, Spokane, Methow, Entiat, Okanogan, Kettle, Pend Oreille, Yakima, and Klickitat Rivers. The Columbia originates in Canada and flows in a southwesterly direction across eastern Washington. The Snake River enters the state near Lewiston, Idaho, flowing westerly to its confluence with the Columbia at Pasco. The Yakima River has its headwaters in the central Cascades and flows eastwardly to its confluence with the Columbia River at Richland. Crab Creek flows westward from its headwaters in eastern Lincoln County, through the Pothole Reservoir, to its confluence with the Columbia River at Beverly, Washington.

Groundwater

In the planning area, the better yielding aquifers are found in sedimentary and volcanic rocks. These rocks are layered, and the mapped geologic formations almost invariably include many layers covering a wide range in permeability. Depending upon the formation, the range may be from highly or moderately permeable to slightly permeable or almost completely impermeable. Commonly, the individual layers or horizons vary in thickness from a few feet to a few tens of feet. When drilling a well, several score of permeable and impermeable horizons may be encountered in a single formation. The permeability and porosity of aquifers generally tend to be inversely proportional to their relative ages. Therefore, the distinction between aquifer units is based on both relative age and rock type.

Groundwater can be obtained at practically any place in the region; however, the quantities obtainable from a well range from a very few gallons to many thousands of gallons per minute. Basalt of the Columbia River Group (and similar basalt) is the most widespread aquifer and yields moderate to large quantities of water to many wells. Recharge from direct precipitation is generally small, but some areas receive additional recharge from streams draining adjacent mountain areas or from irrigation seepage. Over large areas of the plateau, however, recharge is entirely from the scanty local rainfall which limits the quantity of available groundwater. Alluvial deposits are important aquifers along the Columbia River downstream from Grand Coulee Dam; in the Spokane, Okanogan, Yakima, and Walla Walla River valleys; and in the Ephrata-Moses Lake and Pasco areas.

Vegetation

The vegetation of the planning area is divided into two distinct types. From the Cascade crest east, for about 40 to 50 miles at the higher elevations, is a forest association consisting primarily of a pine and Douglas-fir type. The lower ridges support park-like stands of ponderosa pine and grass understory zones with a transition at lower elevations to native and introduced grasses, sagebrush, and associated semidesert shrubs. The same type of transition occurs with decreasing elevation on all of the northern and eastern mountain areas, with the Okanogan Highlands being representative of an extensive transition zone.

Since the last quarter of the 19th Century, eastern Washington in general has been subjected to alteration of native vegetation. Where rainfall, soils, and topogra-

phy are suitable, large areas of dryland grain farming have replaced the native grass and sagebrush cover. On sites primarily along stream courses, where irrigation water and good air drainage are present, the lands produce extensive fruit orchards. This is particularly true in central Washington along the Columbia, Methow, Okanogan, and Yakima Rivers. The Columbia Basin which originally supported a semi-desert type plant association is now the site of the Bureau of Reclamation's Columbia Basin Project. The soils in this area have responded favorably to the introduction of irrigation water from Lake Roosevelt.

Special Status Plant Species

Within the planning area there are 205 special status vascular plants considered to be endangered, threatened, or sensitive in Washington by the Department of Natural Resources, Washington Natural Heritage Program. Twenty-one of these species are candidates for federal listing (1980 Federal Register, Notice of Review and 1983 supplements).

Wildlife

There are 640 recognized species of birds, mammals, fish, reptiles, and amphibians in Washington state. Of these, 536 species are classified as nongame or nonhunted species. Nine species or subspecies classified as big game animals are found in the planning area: mule deer, white-tailed deer, Rocky Mountain elk, black bear, cougar, mountain goat, bighorn sheep, lynx, and moose. Other animals found in the planning area include the grizzly bear, wolf, and woodland caribou which are classified as endangered by the state of Washington and are protected by federal and state law (see Special Status Animal Species section). The planning area supports 21 species of upland game: blue grouse, ruffed grouse, spruce grouse, white-tailed ptarmigan, sage grouse, sharp-tailed grouse, ring-necked pheasant, valley quail, mountain quail, scaled quail, bobwhite quail, chukar partridge, Hungarian partridge, wild turkey, mourning dove, band-tailed pigeon, common snipe, cottontail rabbit, snowshoe hare, black-tailed jackrabbit, and white-tailed jackrabbit.

Furbearing animals are found throughout the planning area in almost every major habitat type. All species in this group have furs of commercial value. For planning purposes, furbearer species have been grouped into four general categories: (1) Terrestrial Furbearers: bobcat, lynx, long-tailed weasel, sharp-tailed weasel, badger, marten, Cascade red fox, and lowland red fox; (2) Aquatic: beaver, muskrat, river otter, mink, and raccoon; (3) Unclassified: coyote, striped skunk, spotted skunk, nutria, and opossum; and (4) Protected: wolf, fisher, and wolverine (WSDG 1982).

Fish habitat is found throughout the district, and supports the following primary species: brown trout, cutthroat trout, rainbow trout, eastern brook trout, largemouth bass, smallmouth bass, perch and ling. Anadromous fish (kokanee and steelhead) inhabit eight rivers in the planning area: Columbia, Entiat, Klickitat, Methow, Okanogan, Snake, Wenatchee and Yakima Rivers. Anadromous fish habitat occurring on public land, however, are relatively small and scattered.

Special Status Animal Species

The bald eagle, which is federally listed, regularly inhabits public land in the planning area. Bald eagles winter along most of the major rivers in eastern Washington but are most abundant along the Columbia River. Largest concentrations of eagles occur along the river from Grand Coulee Dam to Wells Dam. The most important bald eagle winter roosting area on public land is designated as an ACEC (Brewster ACEC).

Two other federally listed threatened/endangered raptor species, the northern spotted owl and the peregrine falcon, also inhabit BLM lands in the district. The northern spotted owl may utilize public land located on the eastern slopes of the Cascade Mountain Range. The peregrine falcon can be found occupying lands throughout the Columbia basin.

Of the three threatened/endangered big game species found in Washington state (grizzly bear, wolf, and woodland caribou), the woodland caribou and grizzly bear may occasionally use small parcels of BLM land in the mountainous areas of northeast Washington. Habitat acreage on BLM land in these areas is very small and considered to be of little or no importance to these species.

Other Sensitive or Unique Species

A number of other animals are of management concern because of their scarcity, limited habitat, or susceptibility to human activities. These species include: pygmy rabbit, ferruginous hawk, Swainson's hawk, lynx, long-billed curlew, wolverine, Columbian sharp-tailed grouse, burrowing owl, yellow warbler, western bluebird, Lewis' woodpecker, golden eagle, prairie falcon, white-tailed jackrabbit, and western spotted frog. Their use of public lands is sporadic and not well defined in many cases. If any of these sensitive or unique species are identified, however, special consideration for their requirements would be undertaken.

Riparian Areas

Approximately 94 miles of riparian habitat of significantly varying quality, quantity and type have been inventoried on BLM lands in the planning area. These riparian habitats are especially important because they are a critical source of biological diversity, and degradation of their values could adversely affect a wide range of wildlife values.

Recreation

The diversity of the public lands in BLM's Spokane District provides for a wide range of dispersed recreational activities including fishing, hunting, hiking, camping, off-road vehicle riding, and horseback riding. Six areas in the district receive concentrated recreational use: Yakima River Canyon, Juniper Forest (including the Juniper Dunes Wilderness), Saddle Mountains, Douglas Creek, Palmer Lake and Chopaka Lake. The type of recreation use varies between areas; however, all areas have one commonality which is that recreational activity of each is increasing to the point where special management attention is required.

Geology and Mineral Resources

The planning area covers four physiographic regions in Washington: Cascade Range, Columbia Basin, Okanogan Highlands, and the Blue Mountains described as follows:

Cascade Mountains - North of Snoqualmie Pass, the Cascade Range is made up of structurally complex igneous and metamorphic rocks, while south of the pass, volcanic rocks with simple structures predominate. This region has known coal deposits, and portions have potential for oil and gas.

Columbia Basin - This region consists of a large basalt plateau that extends from the Columbia and Spokane Rivers on the north, to Oregon and Idaho on the south and east. It occupies the central part of the planning area and has been identified as being prospectively valuable for oil and gas resources.

Okanogan Highlands - This region forms the mountainous northeastern portion of Washington. The rock types include sedimentary, metamorphic, and igneous rocks, ranging from very old (PreCambrian) to very young (Pleistocene) in age. This region is mostly noted for its valuable locatable minerals.

Blue Mountains - The Blue Mountains are part of a mountainous complex making up a separate geomorphic province that lies mostly within northeastern Oregon. Within Washington, the Blue Mountains are a broad northeast-trending, basalt-covered, anticlinal arch.

Leasable Minerals - Oil and Gas

The potential for oil and gas resources throughout the planning area is shown on Map 4. Approximately 6.9 million acres, or 37 percent of the mineral estate in the planning area, is federally owned. About 7.8 percent of the mineral estate in the planning area (1.5 million acres) involves federal ownership in the Columbia Basin and east Cascades Range which is considered to have high to moderate potential for gas, and possibly, oil. The primary federal land managing agencies for these lands are the Bureau of Land Management, Bureau of Reclamation, Department of the Army, U.S. Fish and Wildlife Service and the Department of Energy.

The planning area has only one oil and gas field (which is abandoned) and no Known Geologic Structures (KGSs). During peak periods, thousands of lease applications have been processed annually, particularly in high potential areas. For example, almost 3,200 lease applications were submitted for a limited amount of public lands in the Yakima Firing Center when they were opened to leasing in 1981. An average of over one million acres of federal mineral estate was leased annually from 1981 through 1987, the peak leasing period (see Table 3-1).

A total of 457 exploratory oil and gas wells have been drilled in the state, of which over 100 had oil and gas shows. Since 1900, there have been 97 wells drilled for oil and gas exploration in the planning area, with most activity concentrated in the Columbia Basin. The Rattlesnake Hills gas field in Benton County, Washington, had commercial production from a sedimentary

Table 3-1. Active Oil and Gas Leases in the Planning Area

Year	Number of Leases	Acreage
1981	166	224,657
1982	710	1,436,249
1983	816	1,434,367
1984	808	1,392,925
1985	839	1,361,430
1986	683	928,824
1987	563	721,941

interbed in basalt at 700 to 1,200 feet, and yielded an estimated total of 2.3 billion cubic feet of gas prior to its abandonment in 1941. One recent well in the Yakima Canyon yielded 500,000 (0.5 million) cubic feet of gas per day, while another on Saddle Mountains yielded 5.5 million cubic feet of gas per day, but both were considered to be noncommercial under current economic conditions.

The geologic formations appear most suitable for gas, although there is a slight chance that oil exists. The current major plays are in the northwestern Columbia Basin and the east-central Cascade Range. In central Washington, Eocene nonmarine sedimentary and volcanic rocks occur extensively, overlying Jurassic and Cretaceous metamorphic rocks. Exploration is extremely difficult because the Miocene Columbia River Basalt forms a cap over most of this area, exceeding 11,000 feet thick in places. Eocene rocks can be quite thick locally (4,000-20,000 feet), and Eocene lacustrine and fluvial shales and coal beds are potential source rocks for gas.

According to Tennyson & Parrish (1987), the most promising areas for the occurrence of leasable minerals are within either fluvio-lacustrine rocks in Eocene strike-slip basins in central Washington, or in regionally-deposited Upper Cretaceous marine and Eocene-Oligocene fluvio-lacustrine sequences. In fault-controlled basins below the basalt, the most likely reservoir rocks would be Eocene or Oligocene fluvial sandstones analogous to the Roslyn, Chumstick, and Wenatchee Formations, and the traps could be either structural or stratigraphic. Outside these areas, Eocene arkosic fluvial sandstones would be the likely reservoir rocks. Average porosity of sandstones is estimated at 6-18 percent with potential recovery of up to 60 percent of available gas. Target depths are in the 6,000-15,000 feet range.

The area identified as high potential on Map 4 includes the USGS play area, possible southern extensions of the Republic graben structures, and sedimentary formations and east-west structures which occur south of the Olympic-Wallowa lineament. Medium potential areas include lands adjacent to the high potential areas which meet criteria for classification as prospectively valuable for oil and gas. The areas shown as having low to no potential are outside the primary sedimentary accumulation areas and typically involve extensive areas of metamorphic and igneous intrusive rocks.

Up to 10 major faulted anticlinal folds, each three to six miles wide and from 75 to 100 or more miles long, are present within the planning area. The potential traps range from 3,000 to 25,000 acres in size and could each contain 40 billion to 1 trillion cubic feet of gas.

The USGS has estimated total recoverable conventional gas resources within the planning area ranging from a low of 0.43 trillion cubic feet (valued at $1.3 billion) to a high of 2.39 trillion cubic feet (valued at $7.5 billion). The mean estimate of recoverable resources is 1.16 billion cubic feet of gas (valued at $3.6 billion).

Little information is available on the presence of hydrogen sulfide in the formations targeted for oil and gas exploration. Hydrogen sulfide is a colorless, extremely toxic gas often found dissolved in oil.

Presently, exploration in the Columbia Basin is at a standstill. Low prices, high exploration costs, restrictive surface management practices on federal and state lands, and lack of discoveries from recent drilling efforts have discouraged additional work by the most active exploration companies. Other companies have expressed interest in leasing and exploration work, but leasing of federal lands is on hold pending completion of this RMP amendment.

Part 2

Specific Descriptions

Yakima River Canyon

Refer to the site description of the Yakima River Canyon in Chapter 2, Alternative 2, Proposed ACEC Designations.

During most of the 1980s, 100 percent of the area was leased for oil and gas resources. Two exploratory (wild cat) wells drilled in the canyon, specifically in the river terrace east of Roza Dam, encountered substantial amounts of natural gas.

Upper Crab Creek

Upper Crab Creek Management Area is located in Lincoln County, Washington and is approximately 36 miles west of Spokane. The area contains approximately 16,263 acres of public land (see Figure 3). Dominant features of the management area include the riparian areas of Crab, Wilson, and Coal Creeks; and the upland scabland formed by the flood waters of glacial Lake Missoula that is theorized to have taken place some 18,000 to 20,000 years ago.

The area receives approximately 10 to 14 inches of precipitation annually. Native vegetation consists of shrub-steppe plant community with water birch,

cottonwood, willow or aspen scattered in the riparian areas. Found within these communities are 18 special status plant species.

Livestock grazing is authorized on 23 allotments in this area. In the Upper Crab Creek area, 783 AUMs are authorized for cattle grazing on 7,400 acres.

Mineral leasing is also permitted in this management area. During the peak leasing period in the 1980s, all of the federal mineral estate in the area was leased for oil and gas resources. Exploration in the area, however, has been limited to geophysical exploration activities.

Socioeconomic Conditions

Area and Population

The Spokane District planning area includes 20 counties, covering roughly two thirds of the state of Washington. The largest communities are Spokane, Moses Lake, Ellensburg, Wenatchee, Yakima, Richland, Pasco, and Kennewick. Unless otherwise indicated, the socioeconomic analysis will concentrate on the Columbia Basin in the southern half of the planning area.

The 1986 population was estimated to be 1,055,200 in the planning area as a whole, of which 978,300 (almost 93%) were in the Columbia Basin (see Table 3-2).

Economic Conditions

From an employment perspective, the leading economic sectors in the planning area are agriculture, food processing, wood products, metal products, services, retail, mining, and government.

Oil and gas leasing and operations, despite the absence of production to date, have contributed substantially to the economy within the Columbia Basin. During the past fifteen years, over $110 million has been expended in the planning area including exploratory drilling (alone estimated at over $90 million), and leasing and geophysical operations (estimated at $20 million). Equipment and personnel for drilling crews are usually brought into the state for the project. Geophysical operations generally involve bringing equipment from out of state and employing up to 60 people per crew, of which about 15 to 20 come from out of state while the other 40 to 45 are hired locally.

Table 3-2. Population and Economic Activities by Counties in Spokane BLM District (1986)

County	Population	Principal Economic Activities
Adams	13,900	Food processing/Agriculture
Asotin	17,000	Agriculture/Lumbering
Benton	104,000	Food processing/Chemicals/Metal Products/Nuclear Products
Chelan	48,900	Agriculture/Aluminum Manufacturing/Wood Products/Food Processing
Columbia	4,100	Agriculture/Food Processing/Wood Products
Douglas	23,300	Agriculture/Metal Industries
Ferry	6,100	Mining/Wood Products/Agriculture
Franklin	35,300	Food Processing/Publishing/Agriculture/Metal Fabrication
Garfield	2,500	Agriculture
Grant	50,500	Food Processing/Agriculture
Kittitas	25,000	Food Processing/Agriculture/Wood Products/Metal Fabrication
Klickitat	16,600	Wood Products/Metal Industries/Agriculture
Lincoln	9,700	Agriculture/Wood Products/Mining
Okanogan	31,600	Wood Products/Agriculture
Pend Oreille	9,000	Wood Products/Agriculture/Mining
Spokane	355,900	Food Processing/Apparel & Textile Manufacturing/Publishing/Metal Fabrication/ Agriculture/ Electronics/Machinery Manufacturing/Wood Products
Stevens	30,200	Wood Products/Mining/Metals Processing
Walla Walla	48,500	Food Processing/Agriculture/Wood & Paper Products/Manufacturing
Whitman	39,500	Agriculture/Wood Products/Mining/Manufacturing
Yakima	183,600	Agriculture Food Processing/Wood Products/Manufacturing
Total	**1,055,200**	
Columbia Basin*	**978,300**	

*Columbia Basin total includes all counties above except Ferry, Okanogan, Pend Oreille, and Stevens.

Source: 1990 Washington State Yearbook (A Guide to Government in the Evergreen State)

Chapter 4
Environmental Consequences



Environmental Consequences

This chapter describes the environmental consequences that would result from implementing either of the Alternatives. These consequences are compared to the existing situation, as described in Chapter 3.

Air Quality

During all phases of oil and gas leasing and operations, including geophysical, insignificant amounts of gases and particulate matter are released as a result of the operation of drilling rigs, vehicle engines, dust, etc.

Under Alternatives 1 and 2, small amounts of natural gas and carbon dioxide may be released into the atmosphere during well testing and workover operations, or through temporary flaring for well control. Under most conditions, well control measures minimize or prevent release of gases. These releases of hydrocarbons and gas would be short term and occur intermittently over the life of the wells. Due to the small number of wells anticipated, this impact would not be significant.

No other measurable impacts to air quality are anticipated for either alternative.

Soils

Under Alternatives 1 and 2, oil and gas leasing and operations in both the exploration and development stages would result in an increase in soil compaction and minor amounts of soil erosion. Soil compaction and erosion would increase puddling, surface runoff erosion, and sediment delivery to streams. These impacts would be caused by the construction and use of roads and trails, and other related activities that would expose the soil. Surface erosion would be short term, lasting from two to three growing seasons following reclamation. It could take from 18 to 40 years for compacted soil to return to its pre-disturbed state. On the average, an estimated 120 acres per year (or 1,740 acres over a 15-year period) could be disturbed as a result of geophysical activities. The disturbance from exploratory wells would be much less, averaging about 4.6 acres per year or about 70 acres over a 15-year period. Of this, 60 percent could be on federal lands which would equate to 2.8 acres/year disturbance or 42 acres/15 years. About 30 to 270 acres of disturbance would result from full development, involving 20 to 160 acres of federal land.

Under both alternatives, impacts from oil and gas leasing and operations would be localized and would not, therefore, significantly affect soil resources.

Under Alternative 1, the soil disturbance caused by unrestricted ORV use would continue to cause increased soil compaction, erosion, and sediment delivery to streams and rivers.

Under Alternative 2, soil erosion conditions would persist on the previously disturbed areas over the short term (one to two growing seasons). However, over the long term, 5 to 10 years, the proposed changes in ORV designations would result in a decrease in soil erosion, and sediment delivery to streams and rivers. The effects of soil compaction would persist much longer as indicated above.

The management actions associated with proposed ACEC designations under Alternative 2 should curtail future activities that would cause accelerated soil erosion, compaction, or sediment deposition to water bodies. No significant impacts to soils, short-term or long-term, are anticipated to result from the implementation of either of these alternatives.

Water Resources

Impacts to surface water quality from oil and gas leasing and operations would be the same under both alternatives. There would be short-term increases in sediment loads to streams from trails and road surfaces and other surface-disturbing activities, such as construction of drilling pads. Long-term sediment increases would be minor and directly associated with active well sites and road surfaces.

Surface water yield is expected to increase primarily from areas where the soil has been compacted such as road surfaces, trails, or drilling pads. These increases, under either alternative, are not expected to significantly affect the stream flows of creeks or rivers within any of the management areas.

Alteration of subsurface flows from seismic or geophysical activities utilizing explosive charges, thumpers, etc. could occur if these activities are within close proximity of springs. This could result in reduced flows or even the loss of all waters to existing springs and wells. Conversely, the flows could be increased. Realization of either decreased or increased water flows could have long lasting and possibly permanent impacts.

Under Alternative 1, there would be some minor increases in water quantity and a corresponding decrease in water quality from the areas open to ORVs. Under Alternative 2, in those areas where ORVs are limited to designated roads and trails, the impacts would be similar to those described above but less intense.

The management actions associated with the proposed ACEC designations under Alternative 2 would curtail activities that would affect water quality or quantity. No significant impacts, short-term or long-term, to the water resources are anticipated from implementation of either of the alternatives.

Vegetation

Rangeland

Under both alternatives, vegetative communities disturbed by vehicles during oil and gas leasing and operations would take 10 to 15 years to recover completely. Seismic lines may become ORV routes and cattle trails, resulting in permanent loss of vegetation in limited areas. Similar impacts could be expected during the development stages. Although considered important locally, these impacts are not expected to significantly affect the human environment.

ORV activity, under both alternatives, would result in the continued loss of some vegetation. In areas where ORV activities are unrestricted, new roads and trails could develop; continued use of the areas may result in the permanent loss of vegetation from these areas. Vegetative communities directly disturbed by ORV activity would be expected to decline to early seral ecological status.

Less vegetative disturbance would occur under Alternative 2 than under Alternative 1, since Alternative 2 restricts ORV use to designated roads and trails in designated areas. These designated areas would experience no net loss of vegetation from ORV activities, but would experience loss under Alternative 1 as ORVs continue to use undisturbed sites. In areas previously open to ORV use but restricted to designated roads and trails under Alternative 2, there would be an increase in vegetation away from roads and trails. No such recovery is expected under Alternative 1, as ORV use would continue without any additional restrictions.

Under Alternative 1, because of the potential effects of livestock grazing and ORV use, plant communities could gradually revert to an earlier seral stage similar in character to the rangeland found throughout the Columbia Basin. This impact would be long term and take the area at least 10 to 15 years to return to its current condition. ACEC designation and subsequent management protection from livestock grazing and ORV use would protect the two relic plant communities under Alternative 2. Relic plant communities could be degraded by oil and gas activity under Alternative 1. Special stipulations, ACEC designation, and subsequent management protections would protect relic plant communities under Alternative 2.

Forestland

Impacts to forest vegetation under either Alternative 1 or 2 would be minimal since there is a low likelihood of any oil and gas leasing/operations occurring in the forested land areas. If some activity does occur, the primary impact would be from road construction. The forested land disturbed by road construction would essentially be lost from the timber productive base over the long term (40 to 70 years). With the amount of activity anticipated, this impact could affect from less than one acre per year, to as much as two acres a year. This would not be a significant impact.

The ACEC recommendations and the change in ORV designations would not affect the forest vegetation on the District.

Risk of Wildfires

Manipulation of vegetation and increased human activities caused by oil and gas leasing/operations would increase the risk of wildfires. This would occur because site disturbances change the nature of the fuels (vegetative characteristics). The clearing of brush or trees from roadways or work sites results in an increase in the percentage of dead woody fuels in an area. Dead fuels retain less moisture than live fuels, increasing the probability of ignition if brought into contact with heat sources, and also the intensity, rate of spread, and resistance to control of a wildfire once started.

The development or use of roadways and sites also change the nature of the types of fuels present. Such site disturbances generally cause a reduction of shrubs and perennial grasses, and an increase in forbs and annual grasses. As a rule, these forbs and annual grasses are smaller in diameter and therefore reach dead or dormant stage at a faster rate. This results in drier fuels with increased ignition probability and rates of spread.

As use of the roads and sites increase, the human-caused risk of wildfire starts also increases. The most probable kinds of human-caused ignition result from vehicle use (catalytic converters, mufflers), smoking, and activity uses (welding, grinding, on-site fire use).

Access development also increases human-caused risk through road and trail use not associated with oil and gas leasing and operations. Improved access may, however, also reduce the response time for fire suppression forces which would be a positive impact.

Accordingly, case-by-case consideration of the final disposition of roads and trails would be made by the Authorized Officer. Based upon the current fire history of BLM lands in Washington, an increase of about one fire over a 10-year period could be expected. This would not be a significant risk.

Noxious Weeds

Under Alternative 1, surface disturbance by oil and gas leasing and operations and ORV activities would increase the distribution and size of noxious weed infestations. The standard stipulations and Conditions of Approval (Appendix A) requiring rehabilitation and noxious weed control for oil and gas activities would mitigate the ultimate size of noxious weed populations, but some noxious weeds would remain in new areas where they were introduced.

Under Alternative 2, noxious weed infestations would increase with surface disturbance by oil and gas activities and ORV travel. The standard stipulations and Conditions of Approval requiring site rehabilitation and noxious weed control would mitigate the ultimate extent and size of noxious weed populations, but some noxious weeds would remain in new areas to which they are introduced. There would be no difference in noxious weed impacts from oil and gas activities between the two alternatives. ORV restrictions proposed in Alternative 2 would reduce the extent of noxious weed infestations in the restricted areas as compared to Alternative 1 by lessening surface disturbance.

Noxious weed infestations in areas proposed for ACEC designation may be less than under Alternative 1 if ACECs are designated and managed to allow less surface disturbance than would occur without ACEC designation.

Livestock Grazing

Under Alternatives 1 and 2, anticipated impacts relative to oil and gas leasing and operations would be similar. Conditions of Approval requiring cattle guards to be installed in fences leading into pastures would prevent livestock from wandering out whenever gates are left open during extensive truck or equipment activity. However, there may be increased loss of livestock due to increased traffic. These losses are anticipated to be less than one per year.

Temporary forage loss, affecting two to three Animal Unit Months (AUMs) per well site, could be expected as long as the access roads and drill pads are in use. However, COAs for reclamation requiring recontouring and revegetation of these sites would restore forage production. The revegetation process would include eliminating livestock use for a minimum of two growing seasons. This could cause a disruption in the normal grazing use of an area, the severity of which would depend upon each specific situation.

The potential development of livestock water encountered during the drilling operations would be ensured through COAs which require that BLM be notified of any aquifers which have the potential for development. One COA provides that any water well drilled by the lessees to provide water for drilling purposes be turned back to the BLM for development for livestock or wildlife purposes.

If full development occurred in the planning area as described in Chapter 2, 275 AUMs of livestock forage could be lost over the 20 years. This is only one percent of the total of BLM for the planning area and is considered insignificant.

Under Alternatives 1 and 2, in limited instances, ORV activity may impact livestock grazing through damage to livestock management facilities, disturbance of normal grazing use of an area, disruption of reproduction, and livestock weight loss. Increased ORV use in the Saddle Mountains Management Area would impact livestock grazing especially under Alternative 1. Livestock weight gains could decrease, and livestock deaths could increase, due to increased disturbance and harassment.

Under Alternative 2, impacts of ORV use to livestock grazing of the public lands north of the Similkameen River and in the Yakima River Canyon would be reduced due to the increased limitations on ORV use.

None of the above impacts are anticipated to be significant.

There should not be any impacts to livestock grazing relative to additional ACEC designations under Alternative 2 unless the designation would result in decisions to change either levels or season of use.

Cultural Resources and Traditional Cultural Properties

Impacts from oil and gas leasing and exploration, development and reclamation on cultural resources, and traditional cultural properties would be minimal under both alternatives. The standard stipulations and conditions of approval for oil and gas leasing and operations would ensure that significant cultural properties be physically avoided. However, the redesign of oil and gas leasing and operations to avoid cultural properties may result in a disclosure of the location of specific resources; this could result in vandalism, or illegal collection of materials.

Under Alternative 1, lands acquired since the 1987 RMP Record of Decision would be open to ORV use. Areas open to ORV use generally have increased surface impact and damage to fragile archaeological sites, both prehistoric and historic. Increased access to archaeological sites also leads to vandalism and illegal collection of materials. ORV disturbance to traditional cultural properties may disrupt or end traditional practices, such as root collection by Native Americans in areas they consider to be sacred.

In Alternative 2, several ORV restrictions are proposed which would result in a decreased impact upon cultural resources and traditional cultural properties in those areas where the limitations would be imposed. Pending inventory, other areas such as the Saddle Mountains may require additional limitations to protect cultural resources and traditional cultural properties.

The increased designation and management of ACECs under Alternative 2 should not result in any significant impacts to cultural resources or traditional cultural properties. Management practices defined in the ACEC plan(s) would only be permitted to the extent that cultural resources or traditional cultural properties are not affected. However, an indirect effect may result if an ACEC contains either significant cultural resources or traditional cultural properties. In this situation, the publication of the ACEC location would result in increased visitation and a corollary likelihood of unintentional vandalism or illegal collection of historic or prehistoric cultural properties, or disruption of traditional cultural practices.

Wildlife Habitat

Under Alternative 1, the direct losses to wildlife habitat would be limited to areas disturbed by geophysical lines, construction of roads and drill pads. Oil and gas leasing and operations could also result in a loss of nesting habitat for some special status species such as Swainson's or Ferriginous Hawks, and Prarie Falcons. Habitat for pygmy rabbit could also be altered. The areas most likely to be affected would be sagebrush steppe habitat type found in the Columbia Basin. Some passerine species and upland game would be temporarily displaced from these areas. There could be increased disturbance to crucial wintering habitat for upland game, deer, and bighorn sheep. These habitat impacts could cause increased stress to animals during the most critical time periods. These impacts could be both short term and long term depending upon the degree of habitat alteration.

Under Alternative 2, the direct losses would be the same as those stated for Alternative 1. The losses to wildlife habitat would be limited to areas disturbed by geophysical lines, construction of roads and drill pads. It is possible that some unknown or unrecorded crucial wildlife habitat would be lost or disturbed due to oil and gas leasing and operations. However this is not expected to be significant due to the application of the special stipulations and Conditions of Approval and also to the limited amount of disturbance anticipated.

The ORV limitations proposed under Alternative 1 would not result in any changes to wildlife habitat. Under Alternative 2, there would be an increase in the quality of the wildlife habitat in the areas previously open to ORV use. This change would take the form of a potential decrease in disturbance. This would affect approximately 3,700 acres of crucial winter range for mule deer.

The existing ACEC designations under Alternative 1 would not result in any changes to wildlife habitat. The ACEC designations would result in maintaining and/or improving the existing wildlife habitat on approximately 6,000 acres.

Recreation

The impacts from oil and gas leasing and operations on recreation under both alternatives would be considered short term and insignificant. They consist mainly of intrusion into the area by human activity and a small increase in vehicular traffic.

Maintaining the ORV designations as indicated under Alternative 1 would not result in any decrease in ORV recreation. In some areas, such as the Saddle Mountains, ORV activity would be expected to increase as the area becomes known to recreationists. Under Alternative 2, the increased limitations would result in a

decrease in ORV activity in the Okanogan Management Area, north of the Similkameen River. In this area there would be an indirect impact to hunting activity. This area may be less attractive to some hunters, because of the decrease in vehicular access across some of the public lands. There would also be an impact to rock hounding activities on the east end of Saddle Mountains. The ORV limitations would cause increased inconvenience to some of the rock hounding activities especially to those who have historically camped at their diggings.

The ORV limitations proposed for the Yakima River Canyon would not significantly affect recreation since the primary activities occurring there are river oriented.

None of the actions proposed under Alternatives 1 or 2 would significantly affect recreation activities in the planning area.

As the ACECs become known to the general public, there would be an increase in wildlife viewing opportunities along with opportunities to observe some of the unique plant communities that compose some of the ACEC. These impacts are not anticipated to result in any significant shifts in the recreational use patterns on any of these areas. The proposed ACEC designations and the subsequent management actions would not result in any significant impacts to recreation.

Special Status Species

Under Alternative 1, Oil and gas development and production would result in disturbance and/or alteration of habitat of some special status species. Any activity that would occur in these areas could also result in possible reduction of population numbers. The magnitude of this impact would be site specific and may have significant impacts on a species.

Under Alternative 2, disturbance to these areas would be minimized due to the Spokane District Special Stipulations and should not result in any significant impacts. However, there is the possibility that disturbance and/or alteration of some currently unknown important habitat could occur that could not be mitigated entirely through the use of the Conditions of Approval. In these cases the impact would be site specific and could have significant impacts on the particular affected specie.

New road construction, as could occur under both alternatives into previously unroaded or isolated areas, may promote both legal and illegal collection and/or disturbance to the individual species and their habitats and other activities associated with human presence.

Mineral Resources

Resource Protection Emphasis Areas

The RFD projects that as many as 300 geophysical operations could be conducted and 49 new wells could be drilled throughout the planning area.

Oil and gas lessees face numerous environmental obligations in order to comply with applicable laws and regulations. These are incorporated into the lease form (Appendix B - Standard Lease Terms and Conditions, Section 6) and require that oil and gas development must occur in a manner which provides reasonable protection for: other energy and mineral resources (coal, fluid minerals, locatable minerals, mineral materials and non-energy leasable minerals); environmental resources (air, soil, water, vegetation, and visual resources); renewable resources (fish and wildlife habitat, forests and woodlands, livestock grazing, and wild horses); and land use resources (cultural resources, natural areas, recreation, rights-of-way, and wilderness). Discretionary lease stipulations for mitigation of disturbance to environmental resource, energy and mineral resources (other than oil and gas), renewable resources, land use resources, and support services brings about even greater impacts to oil and gas development. These restrictions can be seasonal restrictions, avoidance stipulations, performance standards, no surface occupancy stipulations, or no new leasing.

Application of standard lease terms would not result in any significant irretrievable or unavoidable impacts to oil and gas. No discretionary lease stipulations have been identified for the protection of other minerals. Any energy and mineral resources or freshwater zones encountered in the wellbore require additional plugs, cement, and casing for adequate protection.

Wilderness Study Areas, designated Wilderness Areas, statutory closures (e.g., U.S. Fish & Wildlife Service Wildlife Refuges), administrative closures (e.g., Dept. of Energy Hanford Reservation) result in negative impacts to oil and gas ranging from the loss of some rental income to the irreversible and irretrievable losses of oil and gas resources and the associated royalty income. The magnitude of the loss depends on the resources available in the particular no-leasing area.

The limited opening of the Department of Army Yakima Firing Center for leasing, exploration and development under stringent entry restrictions represents an increase in areas where mineral leasing and operations

are allowed over previous policies. This high potential area was previously closed to such activities.

When combining the numerous forms of leasing restrictions or discretionary mitigation with the myriad of resources, it is evident that leasing under Alternative 2 would result in a decrease in lands available for mineral operations due to an increase in the restrictive measures imposed on oil and gas development over Alternative 1 (the current situation). Geophysical exploration costs would increase, and quality of exploration data would decrease as a result of avoidance or No Surface Occupancy (NSO) areas. Drilling costs would increase as a result of directional drilling requirements in avoidance or NSO areas, and the probability of success would decrease due to the poorer quality of geophysical data. Seasonal restrictions could result in access times being too short for effective exploration and development programs. Performance standards could also increase the cost of exploration and drilling. The cumulative impact of conditions of approval and lease restrictions could hinder or prevent oil and gas exploration and development in certain locations.

Restrictive measures would tend to encourage operators to relocate to nonfederal lands with fewer constraints (e.g., private lands) wherever available. In some cases, favorable hydrocarbon targets may be abandoned due to the cost or difficulty of meeting restrictive measures.

Considering the above information, oil and gas development would be least impacted by allowing lessees to operate under the standard lease terms along with any nondiscretionary mitigation that is currently in effect. This would allow for a more simplified and comprehensive development of oil and gas resources while still promoting the protection of other resources. It should be noted that any discretionary mitigation decided upon in this document would apply only to new leases and not to existing leases.

The leasing and production of oil, natural gas, coal-bed methane, and carbon dioxide reserves would result in irreversible and irretrievable losses of the resources that are extracted and the resources that would remain in the ground as unrecoverable. The extent of these impacts would vary greatly depending on particular reservoirs and development methods.

Required mitigation embodied in Section 6 of the standard lease terms and further defined in the Code of Federal Regulations will protect other minerals penetrated by oil and gas wellbores. This mitigation is enforced through review and COAs which monitor and adjust locations, cementing, and plugging programs in order to protect these resources. These actions are taken on APDs, Sundry Notices, and Rights-of-Way approvals.

The location of oil and gas wells is determined at Application for Permit to Drill (APD) approval. Conflicts between other minerals and oil and gas development and rights-of-way would be alleviated through standard lease terms or through negotiation between operators. Potential coal/oil and gas conflict areas occur in the Roslyn and Taneum-Manastash coal fields in Kittitas County.

The recovery of coal may be reduced in oil and gas areas. Coal mines are required to leave a protective pillar of coal around any wells that are drilled in the mining area. The amount of unrecoverable coal, therefore, depends on the number of wells drilled within the mining zone. As development continues, specific conflicts would become evident. The BLM manager would have to decide whether to forego coal leases or to defer oil and gas leasing until the coal is mined. However, there is no current or anticipated coal leasing interest within coal fields in the planning area. No significant short-term or long-term cumulative impacts are expected to occur under either of the alternatives.

Mineral development could be inconvenienced by the limited or closed ORV designations. In addition to BLM proposed ORV designations in Alternative 2, ORV access on lands administered by surface management agencies other than BLM is generally restricted or prohibited. The effect on minerals would be minor because ORV use authorizations are obtained on a case-by-case basis for oil and gas operations by filing a notice of intent or APD.

New roads resulting from oil and gas activities would have to be reclaimed when no longer needed, which would increase costs to the oil and gas industry. This would be a minor impact.

Avoiding identified areas may hinder development if exploration of unknown mineral potential lands results in large, new discoveries. Costs will increase if a pipeline must be located around an avoidance area. This could be a locally moderate impact but would be minor in relation to the entire planning area. If the avoidance area is large, the entire project may not be feasible.

Impacts to mineral resources as a result of sales, exchanges, etc., could occur where mineral potential is high. Generally the preferred rule is for both surface and subsurface (mineral) estates to be traded in an exchange. However, due to third party encumbrances,

difficulties in the valuation process or a proposal to exchange lands with high mineral potential that would not otherwise be available for exchange, it may be preferable to complete certain exchanges with mineral estate reservations. In these instances disposal of surface acreage located over federal minerals with high mineral potential results in diminished surface use control when permitting development of subsurface minerals. Reuniting federal minerals with federal surface would allow increased surface use control and facilitate better management of federal minerals.

Land acquisition to consolidate public ownership within areas may produce conflicts with private mineral owners, but would allow for greater surface use control.

If land adjustments result in a net gain of federal minerals in areas managed under stringent surface constraints (such as wilderness areas), it could create locally moderate impacts to oil and gas development.

Cumulative Impacts

Exploration and development costs would be higher under the Preferred Alternative because there are more restrictions on oil and gas operations under this alternative than under alternative one (Standard Terms and Conditions). These extra costs may be considered to be significant and may reduce the total effort by the industry, or cause industry to relocate operations onto nearby nonfederal lands that have fewer restrictions. Since a major percentage of the better high potential target areas involve federal lands, and it would be difficult to conduct operations entirely on nonfederal lands, the restrictions may discourage industry interest in eastern Washington.

Conflict with coal resources would be insignificant. Minor amounts of coal would be lost if oil and gas wells are drilled through coal seams. The amount of coal lost due to protective pillars around the wells and required mining configurations to accommodate the wells is not quantifiable.

The Standard Terms and Conditions/Existing RMP Alternative (Alternative 1) would cause more cumulative impacts than the Amended Plan (Alternative 2). Implementation of Alternative 1 may result in significant impacts to some forms of wildlife during critical seasons, and to special status plants and plant communities. Significantly higher erosion rates are possible in fragile soil due to less constraints. The oil and gas industry would be subject to less constraints and the operating costs would be less. This could result in shorter time frames in their development programs. None of the impacts defined above would occur under the Amended Plan, Alternative 2. Under both alternatives, there may be an insignificant increase in noxious weeds.

Chapter 5
Consultation and Distribution



Chapter 5 - Consultation and Distribution

Introduction

This Resource Management Plan Amendment was prepared by an interdisciplinary team of specialists from the Spokane District. Writing of this amendment began in June of 1990; however, a complex process that began in May of 1989 preceded the writing phase. This process included resource inventory, public participation, interagency coordination, and review and updating of the existing management situation analysis on file at the Spokane District Office. Consultation and coordination with a number of agencies, organizations, and individuals occurred in various ways throughout the planning process.

Public Participation

On May 19, 1989, a notice was published in the Federal Register to announce the formal start of the RMP amendment planning process. At that time a planning newsletter was sent to the public requesting further definition of major issues within the planning area and explaining the scope of the plan amendment.

On June 30, 1990 another newsletter was posted to those interested in the planning process, affected parties, and local news media. In addition to outlining the proposed alternatives, this document also listed major issues and planning criteria.

Agencies Consulted

The planning team consulted with and/or received input from the following:

Federal Agencies

U.S. Army Corps of Engineers
U.S. Bureau of Mines
U.S. Bureau of Reclamation
U.S. Dept. of Energy
U.S. Fish and Wildlife Service
U.S. Forest Service
U.S. Geological Survey
U.S. Soil Conservation Service

State and Local Governments

Washington State Department of Natural Resources
Washington State Department of Wildlife

Copies of the draft RMP/EIS supplement have been sent to those listed above as well as the officials, and agencies listed below:

Government Agencies

Federal

U.S. Bureau of Indian Affairs
U.S. Environmental Protection Agency
U.S. National Park Service
U.S. Agricultural Stabilization and Conservation Service

State

Office of the Governor
Office of the Secretary of State
Washington State Commissioner of Public Lands
Washington State Conservation Commission
Washington State Department of Agriculture
Washington State Department of Ecology
Washington State Department of Fisheries
Washington State Department of Transportation
Washington State Division of Geology and Earth Resources
Washington State Farm Bureau
Washington State Library
Washington State Parks and Recreation Commission
Washington State Superintendent of Public Instruction
Washington State Treasurer

County

Twenty counties within the planning area: Adams, Asotin, Benton, Chelan, Columbia, Douglas, Ferry, Franklin, Garfield, Grant, Kittitas, Klickitat, Lewis, Lincoln, Okanogan, Pend Oreille, Spokane, Stevens, Walla Walla, and Whitman.

Congressional

U.S. Senator Brock Adams
U.S. Senator Slade Gorton
U.S. Representative John Miller, District 1
U.S. Representative Allan B. Swift, District 2
U.S. Representative Jolene Unsoeld, District 3
U.S. Representative Sid Morrison, District 4

U.S. Representative Thomas Foley, District 5
U.S. Representative Norman O. Dicks, District 6
U.S. Representative Jim McDermott, District 7
U.S. Representative Rod Chandler, District 8

State Legislature

Senator Ken Madsen, District 2
Senator Lois J. Stratton, District 3
Senator Bob McCaslin, District 4
Senator Gerald L. Saling, District 5
Senator James E. West, District 6
Senator Scott Barr, District 7
Senator Jim Jesernig, District 8
Senator E.G. "Pat" Patterson, District 9
Senator George L. Sellar, District 12
Senator Frank "Tub" Hansen, District 13
Senator Jim Matson, District 14
Senator Irv Newhouse, District 15
Senator Jeannette Hayner, District 16
Senator Dean Sutherland, District 17
Representative Bill Day, District 3
Representative Dennis A. Dellwo, District 3
Representative George Orr, District 4
Representative Mike Padden, District 4
Representative Jean Silver, District 5
Representative Todd Mielke, District 5
Representative Duane Sommers, District 6
Representative John A. Moyer, District 6
Representative Steve Fuhrman, District 7
Representative Bob Morton, District 7
Representative Curtis Ludwig, District 8
Representative Lane Bray, District 8
Representative Darwin R. Nealey, District 9
Representative Eugene A. Prince, District 9
Representative Clyde Ballard, District 12
Representative Alex M. Mclean, District 12
Representative Gary Chandler, District 13
Representative Harold Hochstatter, District 13
Representative Betty L. Edmondson, District 14
Representative Jay R. Inslee, District 14
Representative Margaret Rayburn, District 15
Representative Barbara Lisk, District 15
Representative Richard Neher, District 16
Representative William A. Grant, District 16
Representative W. Kim Peery, District 17
Representative Holly Myers, District 17

Canadian Agencies

International Boundary Commission, Canadian Section
Ministry of Lands, Parks and Housing, British Columbia

In addition, copies of the draft RMP/EIS Supplement have been sent to over 800 individuals, groups, and organizations who expressed an interest in the use and management of the BLM-administered land in eastern Washington.

Chapter 6
List of Preparers, Glossary and Index



Phacelia lenta

Sticky Phacelia is an endemic of the Columbia river which occurs on BLM lands in Douglas county. It grows in crevices on basalt cliffs. It is a Federal Candidate for listing as threatened or endangered.

List of Preparers

While individuals had primary responsibility for preparing sections of the EIS supplement, the document represents an interdisciplinary team effort. In addition, internal review of the document occurred throughout preparation. Specialists at the District and State Office levels of the Bureau reviewed the analysis and supplied information as well. The contributions of individual preparers was subject to revision by other BLM specialists and management during the internal review process.

Name	Primary Responsibility	Discipline	Related Professional Experience
William B. Carleton	Fire Suppression and Management	Fire Management Officer	B.A., English - Univ. Idaho; USFS - 14 yrs; BLM - 10 yrs.
Pamela Camp	Botany	Botanist	B.S., Biology and Range Management - Utah State Univ.; M.S. Botany - Univ. of Nebraska; Research Technician, Utah State Univ. - 3 yrs.; BLM - 12 yrs.
Brent Cunderla	Preliminary data collection - Land Status & Economic Consequences	Geologist	B.S., Geology - Univ. of Wisconsin - River Falls; M.S. Geology - Portland State Univ.; BLM - 6 yrs.
Neal Hedges	Wildlife Habitat	Wildlife Biologist	B.S., Zoology - Washington State Univ.; M.S., Zoology - Univ. of Guelph, Ontario; USFS - 1 yr. BLM - 12 yrs.
Richard Hubbard	Vegetation	Range Conservationist	B.S., Wildlife Science - Texas A & M. Univ.; M.S., Range Management - Colorado State Univ.; BLM - 16 yrs.
Willard Kempe	Appraisal	Appraiser Realty Specialist	B.S., Business Administration - Northern Illinois Univ.; Advanced Degree, Finance and Real Estate - American Savings and Loan Institute; BLM - 24 yrs.
Rick McComas	Vegetation	Natural Resource Specialist	B.S., Forestry - Utah State Univ.; USFS - 1 yr.; BLM - 15 yrs.

Name	Primary Responsibility	Discipline	Related Professional Experience
Dana Peterson	Vegetation	Range Conservationist	B.S., Wildlife Science - Oregon State Univ.; B.S., Range Management - Humboldt State Univ.; BLM - 12 yrs.
Gary J. Yeager	Team Leader	Planning and Environmental Coordination	B.S., Agronomy - Pennsylvania State Univ.; BLM - 13 yrs.
Judy Thompson	Archaeology	Archaeologist	B.S., Anthropology - Portland State Univ.; BLM - 3 yrs.
Sandra L. Gourdin	Word Processing	Information Receptionist	A.A., Business and Liberal Arts - Spokane Community College; BLM - 5 yrs.
Jerald Spessard	Lands and Realty	Adjudicator Realty Specialist	B.S., Biological Sciences - Maryland State College; B.S., Forestry Sciences - Univ. of Montana; Graduate Studies - Forest Policy and Administration - Univ. of Montana; BLM - 22 yrs.
Louis Jurs	Wildlife Fisheries T/E Animals Riparian Ecology	Natural Resource Specialist	B.S., Zoology - Univ. of Nevada; Range Ecology - Univ. of Nevada; USFS - 1 yr.; BLM - 22 yrs.
George Brown	Technical Coordinator	Geologist	B.S., Science - Penn. State Univ.; USBR - 1 yr.; BLM - 11 yrs.
Kathy Helm	Editorial Support	Writer/Editor	So. Ore. State, and Southwestern Ore. State College; BLM - 10 yrs.; other govt. and private agencies - 3 yrs.

Glossary of Terms

Animal Unit Month (AUM) - A standardized measurement of the amount of forage necessary for the sustenance of one cow unit or its equivalent for 1 month (approximately 800 pounds of forage).

Anadromous - Fish which migrate from the ocean to breed in fresh water. Their offspring return to the ocean.

Aquatic - Living or growing in or on the water.

Area of Critical Environmental Concern (ACEC) - Places within the public lands where special management attention is required to protect and prevent irreparable damage to important historical, cultural or visual values, fish and wildlife resources, other natural systems or processes or to protect life and safety from natural hazards.

Critical Habitat - The area of land, water and airspace required for the normal needs and survival of a federally listed threatened or endangered species.

Cultural Resources - Fragile and nonrenewable elements of the environment including archaeological remains (evidence of prehistoric or historic human activities) and sociocultural values traditionally held by ethnic groups (sacred places, traditionally utilized raw materials, etc.).

Cultural Site - Any location that includes prehistoric and/or historic evidence of human use, or that has important sociocultural value.

Cumulative Impacts- The collective and aggregate impacts of all actions affecting a particular resource.

Endangered Species - A plant or animal species whose prospects for survival and reproduction are in immediate jeopardy, as designated by the Secretary of the Interior, and as is further defined by the Endangered Species Act of 1973, as amended.

Federal Land Policy and Management Act of 1976 (FLPMA) - Public Law 94-579. October 21, 1976, often referred to as the BLM's "Organic Act", which provides the majority of the BLM's legislated authority, direction, policy and basic management guidance.

Fluid Energy Minerals - Oil, gas and geothermal energy.

Forestland - Land which is now, or is capable of being, at least 10 percent stocked by forest trees, and is not currently developed for non-timber use.

Groundwater - Water contained in pore spaces of consolidated and unconsolidated surface material.

Habitat - A specific set of physical conditions that surround a species, group of species or a large community. In wildlife management, the major constituents of habitat are considered to be food, water, cover and living space.

Leasable Minerals - Minerals subject to lease by the Federal government including oil, gas and coal.

Noxious Weed - According to the Federal Noxious Weed Act (PL 93-629), a weed that causes disease or has other adverse effects on man or his environment and, therefore, is detrimental to the agriculture and commerce of the United States and to the public health. (From: Supplement to the Northwest Area Noxious Weed Control Program from Final Environmental Impact Statement, March 1987.)

No Surface Occupancy. NSO - A fluid mineral leasing stipulation that prohibits occupancy or disturbance on all or part of the lease surface in order to protect special values or uses. Lessees may exploit the oil and gas or geothermal resources under leases restricted by this stipulation through use of directional drilling from sites outside the no surface occupancy area.

Off-Road Vehicle (ORV) - Any motorized vehicle capable of, or designed for, travel on or immediately over land, water or other natural terrain, excluding (1) any nonamphibious registered motorboat, (2) emergency vehicles, and (3) vehicles in official use.

Public Lands- Any land and interest in land (e.g. mineral estate) owned by the United States and administered by the Secretary of the Interior through the BLM. May include public domain or acquired lands in any combination.

Reclamation -Returning disturbed lands to a form and productivity that will be ecologically balanced and in conformity with a predetermined land management plan.

Recreation and Public Purposes Act (R&PP Act)- This act authorized the Secretary of the Interior to lease or convey public lands for recreational and public purposes under specified conditions of states or their political subdivisions, and to nonprofit corporations and associations.

Residual Impacts - the affects of an operation or activity that remain after all mitigative measures have been implemented.

Right-of-Way - A permit or an easement which authorizes the use of public lands for certain specified purposes, commonly for pipelines, roads, telephone lines, electric lines, reservoirs, etc.; also, the lands covered by such an easement or permit.

Riparian Habitat - Riparian habitat is defined as a specialized form of wetland restricted to areas along, adjacent to, or contiguous with perennially and intermittently flowing rivers and streams, also, periodically, flooded lake and reservoir shore areas, as well as lakes with stable water levels with characteristic vegetation.

Salable Minerals - High volume, low value mineral resources including common varieties of rock, clay, decorative stone, sand and gravel.

Sediment- Soil, rock particles and organic or other debris carried from one place to another by wind, water or gravity.

Special Status Species - Includes the following;

(1) Proposed species are species that have been officially proposed for listing as threatened or endangered by the Secretary of the Interior. A proposed rule has been published in the Federal Register.

(2) Threatened/Endangered species are those officially listed as threatened or endangered by the Secretary of the Interior under the provisions of the Endangered Species Act. A final rule for the listing has been published in the Federal Register.

(3) Candidate species are those species designated as candidates (categories 1 and 2) for listing as threatened or endangered by the U.S. Fish and Wildlife Service/National Marine Fisheries Service (USFWS/NMFS). A list has been published in the Federal Register.

(4) State listed species are those proposed for listing or listed by a State in a category implying potential endangerment or extinction. Listing is either by legislation or regulation.

(5) Sensitive species are those designated by a State Director, usually in cooperation with the State agency responsible for managing the species, as sensitive. They are those species that are: (1) under status review by the FWS/NMFS; or (2) whose numbers are declining so rapidly that Federal listing may become necessary; or (3) with typically small and widely dispersed populations; or (4) those inhabiting ecological refugia or other specialized or unique habitats.

(6) Assessment species are species which are not presently eligible for official Federal or State status but are of concern in Oregon and may need protection or mitigation in BLM actions. (As defined in IM-OR-91-57, Oregon-Washington Special Status Species Policy.)

Threatened Species - A plant or animal species that the Secretary of the Interior has determined to be likely to become endangered within the foreseeable future throughout all or most of its range.

Water Quality - The chemical, physical and biological characteristics of water with respect to its suitability for a particular use.

Wetlands - Permanently wet or intermittently flooded areas where the water table (fresh, saline or brackish) is at, near or above the soil surface for extended intervals, where hydric wet soil conditions are normally exhibited and where water depths generally do not exceed two meters.

Woodland - A forest community occupied primarily by noncommercial species; e.g., juniper, mountain mahogany or aspen groves.

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Appendix A

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Appendix A

Conditions of Approval

Mitigation Authority: Section 6 of Oil and Gas Lease Form

I. Introduction

All proposals for operations are reviewed to ensure conformance with the Resource Management Plan (RMP). Mitigative measures listed in this Appendix represent the pre-lease environmental protection to which the BLM is committed as a result of the analysis in the RMP/EIS. It also supplements the "Standard Operating Procedures" that were defined in Appendix K of the RMP/EIS for all activities, not just for range developments as Appendix K indicated. There is no commitment, however, to specific wording of these measures.

The Authorized Officer will determine, at the field development stage and on a site-specific basis, which measures are necessary to mitigate or avoid environmental impacts. Once attached to an approval document, the measures are known as Conditions of Approval (COAs). It should be noted that the Authorized Officer is not limited to selecting COAs listed herein, but may develop additional COAs as necessary to mitigate unforeseen impacts. Only the most commonly used COAs are listed in this Appendix. Additional measures may be designed for specific operations with their approval subject to conformance with the limitations of the granted lease rights, the guidance set forth in this plan and subsequent amendments, environmental analysis, and State regulations and permit requirements.

In addition to the COAs listed herein, other restrictions on operations will be derived from lease stipulations in alternatives proposed. Such stipulations will depend upon the alternative chosen in the Record of Decision. The COAs shown in this Appendix will apply to either alternative selected.

COAs are not added to authorizations when not specifically applicable or where the necessary mitigation is adequately covered by standard permit conditions. For geophysical operations, the same levels of environmental protection will be required for lessees and non-lessees alike. Use authorizations for non-lessees will include COAs emulating special terms and conditions of the area of operations.

A copy of all COAs, along with a copy of the submitted NOI, should be kept in the field by each seismic crew and available for inspection by BLM personnel.

II. Geophysical Operations

The following guidance is provided for developing standard terms and conditions for geophysical operations. Appropriate standards will be attached to the Notice of Intent (NOI) at the discretion of the Authorized Officer and in accordance with the RMP/EIS and its Record of Decision. This guidance will be used by BLM field personnel to determine what protective measures are needed on geophysical operations. The standard permit terms and conditions will be attached to all geophysical use authorizations. In addition, the use authorization will include any applicable COAs not already included in the operator's proposal.

A. Notification

The operator will notify the Authorized Officer or his representative at least 48 hours prior to beginning operations, keeping in mind that a pre-work conference may be required before approval is granted to proceed. The operator will report progress on a weekly basis until completion.

Prior to commencing with seismic operations, the operator must notify all affected livestock grazing lessees of the expected timing, location, and type of exploration to be conducted.

Any activities proposed outside the approved seismograph line corridor identified in the approved NOI must have appropriate environmental clearances, and also prior approval from the Authorized Officer.

Notification is also required if any wildfires begin, or are observed, during seismic operations. Such wildfires will be reported immediately to the Spokane BLM District at (509) 353-2570 and the appropriate County Sheriff. The operator is liable for the full cost of fire suppression of all fires on or in the vicinity of the project that are set or caused, directly or indirectly by his employees, as a result of operations.

Immediately upon completion of operations, a Notice of Completion of Oil and Gas Exploration Operations and an updated BLM planimetric map (or USGS topographic map) showing revisions to the original NOI will be submitted to the Authorized Officer. This map will be used to perform a final compliance inspection of the exploration area.

B. Measures Specific to Cultural Resources

A Class III cultural resource inventory (i.e., 100% survey), as specified in BLM Manual 8111, is required for geophysical operations on or crossing BLM surface and any staging areas proposed on BLM surface, or in those cases when lessees require specific BLM approval to operate on split-estate lands under the terms of a lease. If a completed archaeological inventory is not available, an inventory will be performed in all areas projected for surface disturbance (e.g., blading, road construction, shot points, vibroseis testing, or jug truck traffic).

The BLM will review the project to identify inventory needs, and may complete the inventory for activities not associated with a lease. If BLM's timeframe to complete the inventory proves unacceptable, the operator has the option of contracting for the necessary inventory. Lessees are responsible for conducting any necessary inventory for lease operations. An archaeologist performing an inventory under contract must have either a BLM Cultural Resource Use Permit and/or a Federal Antiquities Permit available for verification by the BLM Authorized Officer at least 48 hours prior to beginning work on the cultural resource inventory.

Geophysical operations may be conducted without a cultural resource inventory when the following conditions exist: a) the ground is frozen, and/or b) there are no known standing walls, ruins or fragile cultural resources within 500 feet of the operations that could be damaged by seismic or sonic vibrations.

Such conditions must be documented by BLM personnel and approved by the Authorized Officer before an exception is granted.

Upon completion of the cultural resource inventory, a written "Report of Examination for Cultural Resources" will be submitted. The report must be approved by the Authorized Officer before the project work will be allowed to proceed. Inventories and reports must follow the Secretary of Interior Guidelines in the National Register Bulletin 24, "Guideline for Local Surveys: A Basis for Preservation Planning," and BLM Manual 8111.

Evaluation to determine the significance and management values of any cultural resources located in the area of proposed surface or vibratory disturbance should consider the National Register of Historic Places criteria 36 CFR 60.6(d) and the BLM Manual Use Categories 8111.2. Mitigation of resources within the proposed impact zone will be accomplished by compliance with Sections 106 and 110 of the National Historic Preservation Act (NHPA). Any resource determined to be ineligible for the National Register for Historic Places, but which has BLM management use values, will be protected by appropriate mitigation as identified by the BLM Authorized Officer.

A cultural resource monitor (permitted archaeologist) may be required during operation and/or reclamation activities if operations are in a particularly sensitive area and/or reclamation is not done immediately following operations.

All employees of the operator and any subcontractors must be informed by the operator, before commencement of operations, that any disturbance to, defacement of, or removal of archaeological or historical material will be treated as law enforcement and/or administrative issues under current regulations on public lands. After seismic operations are authorized and initiated the seismic operator will not remove, injure, deface, or alter any object of archaeological, historical, or scientific interest. Operators will be held accountable for the conduct of their employees and subcontractors in this regard.

The operator must immediately notify the Authorized Officer of any and all antiquities or other objects of historic, paleontological, or scientific interest including, but not limited to, historic or prehistoric ruins or artifacts discovered as a result of operations. The operator must suspend all activities in the immediate area of the object and will leave such discoveries intact until approval to proceed is granted by the Authorized Officer. The operator must either redesign the project to eliminate further effects, or follow the mitigation requirements set forth by the Authorized Officer concerning protection, preservation, or disposition of any sites or material discovered.

Consultation is required with Native Americans or other cultural groups by 36 CFR 60.4 and the American Indian Religious Freedom Act, Public Law 95-341 (AIRFA) where any geophysical operations have the potential to impact traditional cultural properties. Consultation must comply with the Secretary of Interior's standards described in the National Register Bulletin 38, "Guidelines for Evaluating and Documenting Traditional Cultural Properties."

The consultation, identification, evaluation and mitigation requirements will be undertaken by a BLM Authorized Officer upon notification that geophysical operations are proposed.

C. Considerations for Special Status Plant Species

Stipulation: All vehicle use and surface disturbing activity will be limited to existing roads until a botanical field inventory of the proposed area of disturbance has been completed. This field survey must be completed during the appropriate season for the identification of special status plants. If special status species or plant community values are found, the Authorized Officer may determine not to allow activities if they adversely affect the botanical resources.

Exception: An exception to this stipulation may be granted if the Authorized Officer determines that one or more of the following conditions has been met at the project area:

(a) Existing records indicate that the area involved does not have appropriate habitat.

(b) There is an existing adequate inventory which indicates that special status species or community values are not present, that these botanical resources will not be affected, or that the adverse impacts will not jeopardize the species or community values.

(c) The operator submits a plan which avoids or adequately mitigates impacts.

(d) Existing records indicate that an adequate field inventory can be conducted within the 60 day review period.

Modification: A portion of the lease may be excluded from the requirement for a field inventory if the Authorized Officer determines that one or more of the following conditions has been met:

(a) There has been substantial previous disturbance of the habitat, such as agricultural field cultivation.

(b) Existing records indicate that the area involved does not have appropriate habitat.

(c) There is an existing, adequate inventory which indicates that special status species or community values are not present, that these botanical resources will not be affected, or that the adverse impacts will not jeopardize the species or community values.

Waiver: This stipulation can be waived if the Authorized Officer determines that:

(a) The entire leasehold surface has been previously disturbed or substantially modified (e.g., through cultivation); or

(b) There is an adequate inventory of the entire leasehold indicating that there are no special status plants, community values or suitable habitat on the entire leasehold; or

(c) There is an adequate inventory of the entire leasehold which indicates that impacts can be adequately mitigated by avoidance through standard stipulations (e.g., relocation of activities up to 200 meters).

The BLM will review the project to identify site-specific inventory needs. The lessee/operator is responsible for contracting for the necessary inventory, using BLM approved contractors and botanical survey standards. A botanist performing an inventory under contract must be approved by the Authorized Officer at least 48 hours prior to beginning work. The contractor's written report must be submitted to the BLM, and all inventory work reviewed and approved by the Authorized Officer before the operations will be allowed to proceed.

Monitoring by an approved botanist may be required during operations and/or reclamation activities located in a particularly sensitive area. The operator will undertake additional measures requested by the Authorized Officer to protect or mitigate impacts to botanical resources that may be affected as a result of the operations. Before an operation is approved, a determination must be made as to whether or not any special status species (i.e., threatened, endangered, or sensitive) or critical habitat may be affected.

D. Weed Control

The operator must control noxious weed infestations within the area disturbed by operations for a period beginning with the initial on-the-ground activity and ending two years after revegetation standards have been met. All weed control must be performed in accordance with the April I7, 1986, and May 5, 1987, Records of Decision for the Noxious Weeds Control Program in Oregon and Washington. All noxious weeds included on the appropriate County list, as well as any Class B weeds occurring in specific regions designated by the state, must be controlled to prevent seed production. The operator must also control any new infestation of Class A noxious weeds (i.e. new or potential new invaders) classified by the State where eradication is required by law.

Also, any noxious weeds introduced due to soil disturbance and reclamation activity will be treated by biological, mechanical, or chemical methods as approved by the Authorized Officer. Should chemical methods be approved for use, the lessee must submit a Pesticide Use Proposal to the Authorized Officer at least 60 days prior to the planned application date to allow for environmental analysis.

E. Water Resources/Drainages

In construction of drainage crossings, existing fords should be used if possible. A cut and stockpile process will be used to create a low water crossing or upgrade an existing crossing unless otherwise specified by the Authorized Officer.

Operations will be done in a manner which prevents damage, interference, or disruption of water flows and improvements associated with all springs, wells, or impoundments. It will be the operator's responsibility to enact the precautions necessary to prevent damage, interference, or disruptions. In no instance, however, will blasting or vibrating be allowed within 0.25 mile of springs, wells, or impoundments unless specifically approved by the Authorized Officer.

Water for drilling purposes will not be obtained from federally owned or controlled water sources such as reservoirs and springs unless specific permission is obtained from the Authorized Officer.

Any available information concerning any ground water encountered must be reported to the Authorized Officer.

F. General Guidelines Including Vegetative Clearing/Road Use and Construction

No dirt work or clearing of vegetation will occur without specific approval of the Authorized Officer. Any merchantable timber and/or firewood removed as a result of operations must be cut by the operator to standard log lengths and stacked onsite at a place specified by the Authorized Officer.

During periods of adverse conditions (e.g., thawing, heavy rains, snow, or flooding), all activities off existing maintained roads that create excessive surface rutting will be suspended. When adverse conditions exist, the operator will contact the Authorized Officer for an evaluation and decision based on soil type, slope, vegetation, and cover.

Activities of the seismic operators will not prevent, obstruct, or unduly interfere with any activities of authorized users of the public lands.

All personnel (including contractors and subcontractors) working in the field with the seismic operator will be familiar with and follow the conditions appended to the NOI.

All vehicles (including drills) will be limited to existing roads, except in approved areas. Improvement of existing roads and trails will be permitted only when prior approval is obtained, and then subject to the following restrictions:

(a) When improving existing roads or trails, blading may be allowed only if the trail is impassable by vehicles or geophysical equipment. No widening or realignment will be allowed. Existing trails may require reclamation or closure.

(b) New trails can be constructed only when vehicle and equipment passage is impossible and with the concurrence of the Authorized Officer. No straight line-of-sight trails will be allowed. All trails will be reshaped to original contour (including bench cuts). Waterbars will be placed on slopes as deemed necessary by the Authorized Officer.

(c) There will be no straight line-of-sight dozing unless approved by the Authorized Officer. All merchantable logs (i.e., logs cut to standard log lengths and at least one-third sound) are to be stockpiled adjacent to the line and readily retrievable without additional disturbance. All remaining slash or vegetative debris is to be pulled and spread back onto the line or access route when the route is no longer needed.

Brush may be crushed or removed from areas where there are no roads or trails by blading with a bulldozer, provided the blade is kept six inches off the ground surface. In open or brush areas, vehicle paths will take an irregular path to discourage line-of-sight paths.

In cases where cleared vegetation presents a fire hazard, the Authorized Officer may require onsite disposal or removal to an approved location such as a local landfill.

Clearing of aircraft landing sites on public lands must be approved in writing by the Authorized Officer prior to use.

All operations will be conducted to preclude causing pollution or changing the character of streams, lakes, ponds, water holes, seeps, or marshes (i.e., all riparian

areas) or causing damage to fish and animal resources unless an exception is granted by the Authorized Officer.

G. Fences

Removal or alteration of existing improvements (e.g., fences, cattle guards) is not allowed without prior approval. A fence will be cut only when no alternative exists. Before cutting through any fences, the operator must firmly brace the fence on both sides of the cut. A temporary gate will be installed for use during the course of operations unless the fence is immediately repaired. Upon completion of operations, fences will be restored to at least their original condition.

H. Reclamation

All surface disturbance will be recontoured and revegetated according to an approved reclamation plan.

Drill holes for seismic operations will be plugged according to BLM standard criteria as identified by the Authorized Officer. Drill hole cuttings will be returned to the hole if possible, or at a minimum, raked and spread out so as not to impede regrowth of vegetation or to create erosion problems.

All debris (e.g., paper, cans, wire, flagging, or other trash) will be removed and properly disposed upon completion of operations. No oil or lubricants will be drained onto the ground.

Reshaping of disturbed areas will be completed, as directed by the Authorized Officer, within 30 days of terminating seismograph work on any line. Selection of seed mixture, timing of seeding, and establishment of adequate vegetative cover will be based on site-specific analysis as determined by the Authorized Officer. Delay of reclamation for any reason (e.g., weather) must be approved by the Authorized Officer.

I. Access to Federal Lands

Access to federal lands across non-federal lands is not guaranteed by the government. Permission to enter or cross private or state-owned lands must be obtained from the landowner(s).

J. Explosives

Powder magazine sites on public lands must be approved in writing by the Administrative Officer prior to use. Powder magazines will be constructed to appropriate standards (43 CFR 1910.109) and set back a safe distance from highways, buildings or other facilities, as required by the Occupational Safety and Health Administration (OSHA). Loaded shot holes will not be left unattended; all explosives transport, storage and use must meet OSHA standards.

K. Noncompliance

If noncompliance with standard terms and conditions or COAs occurs, the operator will be notified by the Authorized Officer and instructed as to appropriate corrective action. If such appropriate action is not taken, the operator will be subject to enforcement action in accordance with 43 CFR 3163.

III. Application for Permit to Drill (APD) Operations

The following guidance will be used to develop COAs for attachment where appropriate to approved APDs, Sundry Notices, or oil and gas related right-of-way actions at the discretion of the Authorized Officer and in accordance with the RMP/EIS Record of Decision.

Some measures identified in the previous section for geophysical work could also apply to some APDs. The following categories represent additional types of mitigative measures considered by BLM resource specialists for every approved field operation.

A. Notification

In order for BLM inspectors to check the initial construction operations, the BLM must be notified when construction begins. To help ensure that all parties understand the requirements for construction, the operator must assure that all employees and subcontractors are adequately aware of any COAs. Examples of such notification requirements are as follows:

The operator or his contractor will contact the BLM Authorized Officer at least 48 hours before beginning any work on public land.

The operator will give the dirt contractor a copy of the Surface Use Plan and any additional BLM COAs before any work begins. A copy of the approved Surface Use Plan will be available onsite for inspection during construction.

The operator or his contractor will also contact the Authorized Officer at least 48 hours before starting, and within 48 hours of completion, of reclamation work.

Proper precautions will be taken at all times to prevent or suppress fires. Range or forest fires on or in the vicinity of the project area will be reported to the

appropriate Surface Managing Agency (SMA) and the appropriate county sheriff. All other fires or explosions that cause damage to property or equipment, loss of oil or gas, or that result in injuries to personnel will be reported to the Authorized Officer and the appropriate county sheriff.

B. Measures Specific to Cultural Resources

See Section II.B.

C. Considerations for Special Status Plant Species

See Section II.C.

D. Weed Control

See Section II.D.

E. Water Resources/Air Quality

See Section II.E.

Water for drilling purposes will not be obtained from federally owned or controlled water sources (e.g., reservoirs and springs) unless approved by the Authorized Officer.

All freshwater and prospectively valuable minerals encountered during drilling will be recorded by depth, cased, and cemented. Temperature surveys and/or bond log will be required should cement fail to circulate to surface on casing strings.

The BLM will be notified, prior to final plugging of the well, of any water aquifers encountered during drilling that have development potential. Wells drilled to provide water for drilling purposes will be approved by, and offered to, the BLM or surface management agency (SMA) for use prior to plugging the water well. Water rights will be held by the BLM or SMA.

All operations will minimize pipeline and road crossings of streams and drainages. Crossing of streams with unstable banks or bottoms will be prohibited unless protective measures are incorporated. Crossings on perennial streams should be constructed during the periods of low flow. When crossings are necessary, culverts and drainage ditches will be designed to maintain the natural surface and subsurface drainages.

Access roads will be properly designed to prevent the blockage of existing drainages.

Drainages will not be plugged by road fills. Drainage crossings will be constructed in a manner to preclude siltation or accumulation of debris. All drainage structures will meet BLM standards for temporary and permanent roads.

Pipeline construction will not block, dam, or change the natural course of any drainage. Suspended pipelines will provide adequate clearance for runoff.

Any release of production water on or across land will need prior approval by the Authorized Officer and Surface Managing Agency this decision will be based in part on water quality tests.

The operator must install sediment traps to collect and settle out sediments where temporary use of equipment is necessary in or near ephemeral or perennial streams.

All development activities may be curtailed, at the discretion of the Authorized Officer, during periods of soil water saturation to protect watersheds from accelerated erosion, increased slumping, and increased sediment and salinity loading.

Well pads, roads, and facilities will be constructed and maintained in a manner to avoid unnecessary impacts to water/air quality.

Every permanent pad, road, or facility site must have an approved surface drainage plan. A diagram of a well site will be developed that depicts production facilities, recontoured slopes, and stabilization measures and be approved by the Authorized Officer prior to installation of production facilities. Drainage from disturbed areas will be confined or directed to preclude increased erosion of undisturbed areas. In addition, no runoff water (including that from roads) will be allowed to flow into intermittent or perennial waterways without first passing through a sediment trapping mechanism. Such structures may include or consist of waterbars, berms, drainage ditches, sediment ponds, or other devices.

F. General Guidelines Including Vegetative Clearing/Road Use and Construction

Measures identified in Section II.F. for Geophysical Operations may also apply to APD Operations. Additional measures specific to vegetative clearing and road use and construction for APD are identified as follows:

The operator must clear all vegetation from the project area, where deemed necessary, prior to any construc-

tion. All clearing must be conducted without mixing soil with vegetation.

Where earth blading is required, stumps will be removed and scattered or buried in an area designated by the Authorized Officer. Where earth blading is not required, stump height will not exceed 12 inches. All slash greater than four inches in diameter will be scattered outside the cleared area, burned, hauled to an off-site disposal area, or stockpiled for use during reclamation as directed by the Authorized Officer.

All cut and fill slopes should be constructed in such a way as to provide slope stability.

Linear-type facilities (e.g., roads, power lines, and pipelines) must cohabit and follow a common route unless otherwise approved by the Authorized Officer. Surface disturbance will be minimized. Surface disturbance that causes active soil movement should be corrected.

Well pads, roads, and facilities will be located to minimize visual impacts, and above-ground facilities painted to blend with the surrounding environment. Such developments will also be constructed and maintained to avoid unnecessary impacts to air quality.

Surface-disturbing activities within or adjacent to intermittent or perennial water sources, associated floodplains, and riparian areas will be allowed only where mitigative measures can be employed to protect floodplains, water quality, and riparian values.

Sensitive wildlife areas (including raptor and sandhill crane nests) will be protected from human-induced surface-disturbing activities to the extent such protection does not unduly hinder or preclude exercising valid existing rights.

All development activities may be curtailed, at the discretion of the Authorized Officer, during periods of soil water saturation to protect watersheds from accelerated erosion, increased slumping, and increased sediment and salinity loading.

For temporary storage, trash and garbage must be in a closed receptacle or a covered earthen pit to prevent contents from escaping. Trash and garbage removed from such receptacles or pits will be hauled to an approved county landfill. Burying of trash and garbage is not authorized.

Upon completion of construction, the amount of surface rock present will not exceed the amount present prior to construction. All excess rock will either be used at the project site or hauled off public land.

1. Roads (On Lease)

Surface disturbance and vehicular travel will be limited to the approved location and approved access route respectively.

Existing roads should be used to the extent possible. Any additional roads needed will be kept to an absolute minimum number, and their size and route location approved by BLM prior to construction. Upon determination of an impending field development, a transportation plan will be requested to reduce use of unnecessary access roads. Roads will be constructed and maintained to BLM road standards (BLM Manual Section 9113).

The initial access to an exploratory well site may be needed as a permanent road later. Alignment of any new road construction should be such that a permanent road can be constructed, where possible, on routes identified by the Authorized Officer or in BLM transportation plans. Because most initial access roads will usually have little residual value for future access, plans will be developed toward their eventual closure and total rehabilitation.

Companies controlling roads which provide access into crucial wildlife areas may be required to close the roads with lockable gates to prevent their general use during critical periods of the year when resource conflicts are present (e.g., hunting seasons and winter). This restrictive measure will be applied where needed to protect wildlife resources or to minimize environmental degradation.

Use of closed road segments will be restricted to authorized agents of: (1) the lessee and/or their subcontractor(s), (2) the BLM, and (3) other agencies with a legitimate need (e.g., WDW and other law enforcement agencies). Unauthorized use or failure to lock gates during specified timeframes by the lessee or its subcontractors will be considered a violation of the terms of the APD or associated grants. This measure will apply to BLM roads and other roads on public lands.

Construction on steep hillsides and near watercourses will be avoided where alternate routes provide adequate access. Unnecessary disturbance of drainages and high erosion hazard areas should be avoided.

Long road grades that are slight to moderate slope should have shallow drainage dips installed after temporary roadbeds have been constructed or during construction of permanent roads.

Temporary Roads: Temporary roads will be planned for only the minimum width needed for exploration. Improvement to existing access will be limited to a 12-foot crowned and ditched road surface with turnouts as needed and minimum disturbance of surrounding soil and vegetation (abrupt back-sloped barrow ditch), unless otherwise approved by the Authorized Officer. New construction will be limited to the same specifications as above. Roads should follow natural contours to minimize cut and fill, with a typical grade no greater than eight percent. Cleared trees and brush along the road right-of-way should be windrowed to the side in convenient clearings. Surfacing material must not be placed on the access road or any location without prior approval from the Authorized Officer and Surface Managing Agency.

Cuts and fills on temporary roads will be designed to minimize surface disturbance. When constructing a road that involves cuts and fills, the character of cut material and depth of cut will be considered. Fill material will not be cast over hilltops or into drainages, so consideration is necessary to determine where the fill material will be deposited. Cut slopes should normally be no steeper than 3:1, and fill slopes no steeper than 2:1. When construction is necessary, surface soil materials will be windrowed and stockpiled for later rehabilitation of the roadway.

Stockpiles should be located on the uphill side of the road. Any surface soil material expected to be stockpiled for more than one year will be seeded or otherwise protected from wind and water erosion. The stockpile should be marked or segregated to avoid loss or mixing with other subsurface materials.

The operator will regularly maintain all roads used for access to the lease operation. A maintenance plan may be required including, but not be limited to: upgrading of existing roads, blading, ditching, culvert or drainage installation, and graveling or capping of the roadbed, and weed control.

Culverts will be installed keeping the inlet and outlet on original grade and sized to adequately drain the surface runoff. All fill material will be placed in layers not exceeding six inches. Fill material will be properly compacted to ensure stability and to prevent washing out or dislocation of the culvert. Fill slopes, both up and down stream, will be riprapped with a well graded mixture of rock sizes containing no material greater than two feet or smaller than three inches. The ratio of maximum to minimum dimension of any rock will not exceed 6:1. Water turnouts needed to provide additional drainage will be constructed not to exceed two percent slope to minimize soil erosion.

Any access routes previously available to the public will not be blocked unnecessarily from public use.

Waterbar construction may be required on active pipeline routes and roads. Spacing will be determined by the surface owner/manager, dependent upon soil stability and/or erosion potential. General guidelines for installation of waterbars are: less than two percent grade (200-foot spacing), four to five percent grade (75-foot spacing), greater than five percent grade (50-foot spacing). Unstable soils may require a closer spacing, whereas the spacing may be greater on stable soils and rock outcroppings. The waterbars will be constructed to drain freely to the natural ground level and to prevent siltation and clogging.

Any necessary improvement to existing access will be limited to a 14-foot crowned and ditched road surface with turnouts as needed and minimum disturbance of surrounding soil and vegetation (abrupt back-sloped barrow ditch).

Road access for production facilities will be upgraded to BLM resource road specifications (either 14-foot or 20-foot running surface crowned and ditched road). Rock surfacing will be required for all-weather operation. The roads will be maintained reasonably smooth, and free of ruts, soft spots, chuckholes, rocks, slides, and "washboards."

When a road is to be abandoned, rehabilitation may consist of scarifying, waterbarring and barricading. Cut and fill slopes will be reduced to as gentle a grade as the topography permits. Stockpiled soil, debris and fill materials will be replaced on the roadbed and cut slopes to conform to the topography. All disturbed areas will be revegetated where practical, preferably with native perennial species.

The operator will be required to construct waterbars on abandoned roads and pipeline routes subject to the same guidelines listed above for Temporary Roads.

Cattle guards will be installed whenever access roads are located through pasture gates or fences. These cattle guards will be maintained on a regular basis to assure their effectiveness at turning livestock, with maintenance to include cleaning out under cattle guard bases when needed.

New roads constructed for oil and gas purposes within crucial big game winter range and isolated and/or roadless areas will be reclaimed upon completion of the oil and gas operation.

2. Pads

In planning for well sites, tank batteries, sump, reserve and mud pits, and pumping stations, the operator will select locations that involve the least disruption to scenic values and other surface resources. The operator will employ construction techniques and design practices including selection of material, camouflage techniques, and rehabilitation practices that will preserve scenic aesthetic qualities. The following measures will minimize surface disturbance and aid in maintaining the best possible conditions for rehabilitation.

When constructing pads, consideration should be given to the most level location obtainable and steep slopes should be avoided.

The site layout should be adjusted to conform to the best topographic situation, with deep vertical cuts and steep long fill slopes being avoided. All cut and fill slopes should be constructed to at least a 2:1 configuration.

The top layer of soil material will be removed from the location and stockpiled separately from trees or other vegetation.

Surface soil material will be stockpiled to the side of the routes where cuts and fills or other surface disturbance occur during pad construction. Surface soil material should be segregated and not mixed or covered with subsurface material.

3. Pits

Whenever possible, a portable mud pit will be used when drilling with fluids.

Excavations for the permanent impoundment of usable water should be sloped at a 3:1 grade to establish safe access for humans, livestock and wildlife.

Reserve and produced water pits containing oily residue must be overhead flagged. These pits must be fenced with 28-inch, sheep-tight mesh with two strands of barbed wire above, separated by approximately six inches. Berms will be required to keep runoff water out. A minimum of two feet of free board will be maintained between the maximum fluid level and the top of the berm.

Reserve and other containment pits used during the exploration and/or operation of the lease may require fences and/or other devices to exclude livestock and/or wildlife. The need and type of protective requirement will be determined on a case-by-case basis.

Drainage bottoms should not be disturbed excessively, and reserve pits should be located away from any watercourse. In some cases, reserve pits may have to be lined to prevent contamination of groundwater or soil.

Installed pit liners must be impermeable and resistant to weather, sunlight, hydrocarbons, aqueous acids, alkalies, salt, fungi, or other substances likely to be contained in the drilling fluids or produced water. Acceptable liners include those constructed of concrete, asphalt, or flexible synthetic membranes.

The reserve pit liner will be of sufficient strength and construction to ensure impermeability. The liner will be underlain by a suitable bedding material and other measures taken as needed to protect the integrity of the liner.

A leak detection system will be installed to monitor lined reserve pits for detecting liner leakage. The leak detection plan must be submitted to, and approved by, the Authorized Officer during APD approval. This plan must specify the system design including line installation, monitoring plan, and the individual responsible for the required monitoring.

The reserve pit will be constructed with the maximum pit volume in cut and must be scaled to prevent fluid leakage.

Semi-closed or closed mud systems may be required where conditions warrant. Produced water will be injected, contained in a lined pit, or hauled to a federally approved disposal facility.

Before any restoration begins, the reserve pit must be completely dry. Any water remaining in the reserve pit should be disposed in an approved disposal facility.

If air or gas drilling, the operator will control the blooie line discharge dust by use of water injection or any other acceptable method. The blooie line discharge will be a minimum of 100 feet from the blow out preventer and be directed into the blooie pit so that the cuttings and waste are contained in the pit.

If a portable trash cage is not used, a temporary trash pit will be constructed near the mud tanks with steep sides and dug at least six feet into solid undisturbed material. It will be totally enclosed with a fine wire mesh before the rig moves in. Prior to burning trash, the BLM or surface management agency must be notified for federal surface, and the County Sheriff must be notified for private surface.

See Section III.H.5. for further guidelines for reserve pits, specific to reclamation efforts.

4. Pipelines

Alignment, siting, and reclamation of pipelines and flow-lines should be designed to conform to adjacent terrain and to prevent or minimize vehicular travel. If maintenance is necessary in problem areas, use of an all terrain vehicle (ATV) should be considered in lieu of a regular truck. Surface disturbance for pipeline construction will be restricted to the minimum amount necessary, as determined by the Authorized Officer.

For associated pipeline rights-of-way, except for express authorization of a road after construction of the facility is complete, the right-of-way holder will not use the right-of-way as a road for purposes other than routine maintenance or for emergency use. Necessary routine maintenance will be determined through consultation with the Authorized Officer.
All pipelines will be buried and trenches compacted after backfilling, unless otherwise approved by the Authorized Officer. Pipeline routes will not be utilized as access roads unless constructed to accepted road specifications and design and approved by the Authorized Officer.

Existing telephone, telegraph, power lines, pipelines, roads, trails, fences, ditches, and like improvements will be protected during construction, operation, maintenance, and termination of an oil and gas facility. Damage caused by such activities will be properly repaired to a condition which is satisfactory to the Authorized Officer or the facility owner/operator.

Construction: Steep hillsides and water courses will be avoided in the location of pipelines and flow-lines. Flow-line routes should take advantage of road locations to minimize surface disturbance.

Cuts and fills on pipelines will be made only where necessary. Cut and fill slopes should normally be no steeper than 2:1 and graded to conform to the adjacent terrain.

Pipeline routes will be graded to conform to the adjacent terrain, then waterbarred and reseeded.

When clearing is necessary, the width disturbed will be kept to a minimum. Bladed materials will be placed back into the cleared route upon completion of construction.

Surface soil material will be stockpiled to the side of the routes where cuts and fills or other surface disturbance occur during pipeline construction. Further, surface soil material will be segregated and not mixed or covered with subsurface material.

Pipeline trenches will be compacted during backfilling and maintained in order to correct settlement and prevent erosion. Waterbars and other erosion control devices will be repaired as necessary.

Pumping stations will be kept in a neat and well-maintained condition.

In crossing pipelines owned by other companies, it will be necessary to secure an agreement for authorization of crossings.

5. Production

Compaction and construction of the berms surrounding tank batteries will be done prior to storage of fluids and designed to prevent lateral movement of fluids through the utilized materials. The berms must be constructed to contain at minimum 120 percent of the storage capacity of the largest tank within the berm. All loading lines will be placed inside the berm.

Other Guidelines: Surface buildings, supporting facilities, and other structures not required for present or future operations will be removed upon termination of use.

All improvements including fences, gates, cattle guards, roads, trails, pipelines, bridges, water developments, and control structures will be maintained in a serviceable and safe condition.

Mud, separation pits, and other containments used during the exploration or operation of the lease for the storage of oil and other hazardous materials will be adequately fenced, posted, or covered. Additional protective measures may be needed to minimize hazards and prevent access to humans, livestock, waterfowl, and other wildlife.

All production and storage facilities must have adequate protection from spills. The Spill Prevention Control and Counter Measure Plan required by the Environmental Protection Agency must be available for inspection at all appropriate field offices. All spills must be reported to the Authorized Officer.

Any well that is located within 1/2 mile of residences will have appropriate noise mitigation (e.g., hospital muffler, vegetative screening, electric motors) to ensure that federal, state, and local noise standards are met during operation of the well.

Within 60 days of completion of construction, the holder will provide the Authorized Officer with an as-built survey of facilities as constructed.

G. Fences

See Sections II.G. and III. F.3. on "Pits" for guidelines about fences. Additional measures are listed below.

Three sides of the reserve pit will be fenced with four strands of barbed wire before drilling starts. The fourth side will be fenced as soon as the drilling is completed. The fence will be maintained until the pit is reclaimed.

Fencing of areas being reclaimed will be determined on a case-by-case basis.

H. Reclamation

Prior to abandoning authorized facilities, the holder will contact the Authorized Officer to schedule a joint inspection of the site and reach an acceptable abandonment and rehabilitation plan. The Authorized Officer's approval of the plan must be obtained in writing before the holder commences any abandonment and/or rehabilitation activities. The plan may include removal of surfacing material from the road, recontouring, replacement of topsoil, seeding, and mulching.

Rehabilitation will be planned on the sites of both producing and abandoned wells. The entire site or portion thereof not required for the continued operation of the well should be restored as nearly as practical to its original condition. Final grading of backfilled and cut slopes will be done to prevent erosion and encourage establishment of vegetation.

The reserve pit and that portion of the location and access road not needed for either production or production facilities will be reclaimed as described in the reclamation section. Sufficient topsoil will be retained for reclaiming the remainder of the location at a future date. This reserve stockpile of topsoil will be seeded in place using the prescribed seed mixture.

Any noxious weeds which may be introduced due to the soil disturbance and reclamation will be required to be treated at a future date.

1. Site Preparation

Site preparation of disturbed sites may include contour furrowing, terracing, reduction of steep cut and fill slopes, and waterbarring. The disturbed sites will be prepared to provide a seedbed for re-establishment of desirable vegetation and to reshape areas to blend with the natural contour. Such practices may include contouring, terracing, gouging, scarifying, mulching, fertilizing, seeding, and planting.

2. Revegetation

All disturbed areas will be revegetated as soon as possible after the site has been satisfactorily prepared. The operator will reestablish perennial vegetation compatible with surrounding undisturbed vegetation. The selection of the specific seed mixture would be as follows:

The selection of plant species (seed mixes) for rehabilitative purposes should be diverse. It should include grasses, forbs, and where appropriate and feasible, shrubs and trees. Species to be planted as permanent cover shall be indigenous native plant species or their cultivars. Soil-stabilizing annual plant species may be used as cover crops where natural succession would bring in adjacent perennials. Where non-native annuals are used as a "cover crop" it must have been demonstrated that the specie would be unable to reproduce or sustain a viable population.

Introduced, naturalized or non-indigenous plant species, may be included in the approved seed mixture if they support the approved post-operational land uses. In accordance with Executive Order 11987, use of such exotic species or their cultivars will only be considered if:

1. It is demonstrated that no available native, indigenous species can be successfully established;

2. It is documented that the introduction of these species will not have an adverse effect on the native species or the natural ecosystem(s) as a whole, and that the introduced species will be confined within the ecosystem into which it is being considered for introduction;

3. An environmental assessment and, if necessary, an environmental impact statement for introduction of any exotic species on the public lands has been prepared;

Under some circumstances, written concurrence or other approval under applicable regulations may have to be obtained from the Secretary of the Interior for use of other than indigenous native plant species. Exceptions may be granted where the surface ownership is private and the seed mix has been approved by the surface landowner.

The time of seeding and methods of application, including the possible use of seed drill, will be specified

by the Authorized Officer. Where terrain does not permit drill seeding, broadcast seeding will be permitted. All seeding rates should be measured in pounds of pure live seed, using adapted varieties. Only certified seed will be used in reclamation unless otherwise approved by the Authorized Officer. Seeding and/or planting will be repeated until satisfactory revegetation is accomplished, as determined by the Authorized Officer.

Fertilizer needs would be based on soil tests and added accordingly.

After seeding and mulching are complete, the access will be blocked to prevent disturbance.

Revegetation will be considered successful when the percent canopy cover is equal to surrounding undisturbed vegetation. The species considered in measuring percent cover will be those seeded as well as desirable pre-existing species. Undesirable weedy species (e.g., cheatgrass) and noxious weeds will not be seeded unless otherwise directed by the Authorized Officer.

In the event that seeding efforts do not result in successful revegetation, reseeding and/or additional measures will be required for reclamation. Additional measures may include, but are not limited to: soil analysis to determine the need for fertilizer, fertilization, additional seedbed preparation, mulching, wind management, snow fencing, modification of the seed mixture, and fencing to exclude livestock.

In general, the area will be considered satisfactorily reclaimed when the following criteria have been met.

(a) All disturbed areas have been recontoured to blend with the natural topography.
(b) All soil erosion associated with the operation has been stabilized.
(c) The rock content of the surface 12 inches of soil material off road is no greater than the pre-disturbance condition.
(d) An acceptable vegetative cover has been established consisting of a vegetative cover at least equal to that of the pre-disturbance condition.

3. Trash Disposal

See Section III.F.

Prior to site construction of a well, topsoil will be stripped from the site and stockpiled. If expected to be in place more than one year, the stockpiling will also be seeded or otherwise protected from wind and water erosion.

In the event a producing well is developed, the unused disturbed areas surrounding the well location will be recontoured as soon as possible to appropriate conformation (one allowing lease operations and avoiding steep cut and fill slopes). Some or all of the stockpiled topsoil will be evenly distributed over these recontoured areas. Brush cleared prior to construction of the well site will be scattered back over the recontoured area.

Following redistribution of topsoil, a seedbed will be prepared by disking to a depth of four to six inches.

Immediately upon completion of drilling, all trash and debris will be collected from the location, the surrounding area, and the trash pit or cage, and then removed from federal lands.

4. Roads

See Section III.F.1. "Roads."

Waterbar construction will be required on pipeline routes and abandoned roads, following the guidelines in Section III.F.1."Roads" will be used.

5. Drill Pads and Reserve Pits

All excavations, pits, or drill holes will be closed by backfilling when they are dry, and the areas made to conform to the surrounding terrain. Waterbars and terracing may be necessary to prevent erosion of fill material.

All pits, cellars, rat holes, and other bore holes unnecessary for further lease operations, excluding the reserve pit, will be backfilled immediately after the drilling rig is released to conform with surrounding terrain. Pits, cellars, and/or bore holes that remain on location must be posted and fenced as necessary. The type of fence to be constructed will be determined on a case-by-case basis.

The operator may be required to submit a plan at completion of drilling that contains the following:

(a) Methodology showing how the reserve pit mud will be covered to prevent infiltration of water and to prevent puncturing of the liner during backfilling.

(b) A minimum of three feet of over burden over the reserve pit mud.

(c) Final certification that the leak detection system (if used) produced no fluid during backfilling.

Final written certification is required showing that the operator is in compliance with 40 CFR 260 with regard to hazardous chemicals in the drilling fluids within the mud pit. If the operator cannot provide such certification, the drilling fluids and pit liner must be disposed at a federally approved hazardous materials site.

Reserve pit fluids will be allowed to evaporate through the entire summer season (June-August) after drilling is completed, unless an alternate method of disposal is approved. After the fluids disappear, the reserve pit muds will be allowed to dry sufficiently to allow backfilling. The backfilling of the reserve pit will be done in a manner that the muds and associated solids will be confined to the pit and not squeezed out nor incorporated in the surface
materials. When reclamation is complete, the pit area will support the weight of heavy equipment without sinking.

For lined pits, the liner and contents will be buried in place and effectively capped with clay or other impermeable materials, or disposed of in a non-polluting method approved by the Authorized Officer.

Movement of the liner and contents will be minimized to avoid liner destruction and/or residue dispersal.

6. Pipelines

Reclamation and abandonment of pipelines and flowlines may involve: replacing fill in the original cuts, reducing and grading cut and fill slopes to conform to the adjacent terrain, replacement of surface soil material, waterbarring, and revegetating in accordance with rehabilitation practices.

I. Access to Federal Lands

See Section III.F.1. Roads, Temporary Roads for guidelines pertinent to access.

J. Other Measures

Upon determination by the Authorized Officer of an impending field development, a transportation plan will be required to prevent construction of unnecessary access roads and to remove roads which are no longer needed.

Additional site surveys, grading plans, and engineering designs may be required in scenic areas.

Should additional site-specific environmental analyses at the time of exploration or development reveal the need for additional restrictions or the continuance of existing lease stipulations, such restrictions will become part of the development or operational plan.

Survey Monuments: All survey monuments, witness corners, reference monuments, and bearing trees will be protected against destruction, obliteration, or damage. Any markers that are damaged must be reestablished at the lessee's expense in accordance with accepted BLM survey practices defined in the "Manual of Surveying Instruction for the Survey of the Public Lands of the United States."

Burning of solid or liquid wastes usually requires a burning permit. The permit must be obtained from the state air quality agency and county fire protection district. In addition, the BLM Authorized Officer should be notified.

Appendix B

United States
Department of the Interior
Bureau of Land Management

Standard Lease Terms and Conditions

LEASE TERMS

Sec. 1. Rentals—Rentals shall be paid to proper office of lessor in advance of each lease year. Annual rental rates per acre or fraction thereof are:

(a) Noncompetitive lease, $1.50 for the first 5 years; thereafter $2.00;
(b) Competitive lease, $1.50; for primary term; thereafter $2.00;
(c) Other, see attachment, or

as specified in regulations at the time this lease is issued.

If this lease or a portion thereof is committed to an approved cooperative or unit plan which includes a well capable of producing leased resources, and the plan contains a provision for allocation of production, royalties shall be paid on the production allocated to this lease. However, annual rentals shall continue to be due at the rate specified in (a), (b), or (c) for those lands not within a participating area.

Failure to pay annual rental, if due, on or before the anniversary date of this lease (or next official working day if office is closed) shall automatically terminate this lease by operation of law. Rentals may be waived, reduced, or suspended by the Secretary upon a sufficient showing by lessee.

Sec. 2. Royalties—Royalties shall be paid to proper office of lessor. Royalties shall be computed in accordance with regulations on production removed or sold. Royalty rates are:

(a) Noncompetitive lease, 12½%;
(b) Competitive lease, 12½%;
(c) Other, see attachment; or

as specified in regulations at the time this lease is issued.

Lessor reserves the right to specify whether royalty is to be paid in value or in kind, and the right to establish reasonable minimum values on products after giving lessee notice and an opportunity to be heard. When paid in value, royalties shall be due and payable on the last day of the month following the month in which production occurred. When paid in kind, production shall be delivered, unless otherwise agreed to by lessor, in merchantable condition on the premises where produced without cost to lessor. Lessee shall not be required to hold such production in storage beyond the last day of the month following the month in which production occurred, nor shall lessee be held liable for loss or destruction of royalty oil or other products in storage from causes beyond the reasonable control of lessee.

Minimum royalty in lieu of rental of not less than the rental which otherwise would be required for that lease year shall be payable at the end of each lease year beginning on or after a discovery in paying quantities. This minimum royalty may be waived, suspended, or reduced, and the above royalty rates may be reduced, for all or portions of this lease if the Secretary determines that such action is necessary to encourage the greatest ultimate recovery of the leased resources, or is otherwise justified.

An interest charge shall be assessed on late royalty payments or underpayments in accordance with the Federal Oil and Gas Royalty Management Act of 1982 (FOGRMA) (30 U.S.C. 1701). Lessee shall be liable for royalty payments on oil and gas lost or wasted from a lease site when such loss or waste is due to negligence on the part of the operator, or due to the failure to comply with any rule, regulation, order, or citation issued under FOGRMA or the leasing authority.

Sec. 3. Bonds—A bond shall be filed and maintained for lease operations as required under regulations.

Sec. 4. Diligence, rate of development, unitization, and drainage—Lessee shall exercise reasonable diligence in developing and producing, and shall prevent unnecessary damage to, loss of, or waste of leased resources. Lessor reserves right to specify rates of development and production in the public interest and to require lessee to subscribe to a cooperative or unit plan, within 30 days of notice, if deemed necessary for proper development and operation of area, field, or pool embracing these leased lands. Lessee shall drill and produce wells necessary to protect leased lands from drainage or pay compensatory royalty for drainage in amount determined by lessor.

Sec. 5. Documents, evidence, and inspection—Lessee shall file with proper office of lessor, not later than 30 days after effective date thereof, any contract or evidence of other arrangement for sale or disposal of production. At such times and in such form as lessor may prescribe, lessee shall furnish detailed statements showing amounts and quality of all products removed and sold, proceeds therefrom, and amount used for production purposes or unavoidably lost. Lessee may be required to provide plats and schematic diagrams showing development work and improvements, and reports with respect to parties in interest, expenditures, and depreciation costs. In the form prescribed by lessor, lessee shall keep a daily drilling record, a log, information on well surveys and tests, and a record of subsurface investigations and furnish copies to lessor when required. Lessee shall keep open at all reasonable times for inspection by any authorized officer of lessor, the leased premises and all wells, improvements, machinery, and fixtures thereon, and all books, accounts, maps, and records relative to operations, surveys, or investigations on or in the leased lands. Lessee shall maintain copies of all contracts, sales agreements, accounting records, and documentation such as billings, invoices, or similar documentation that supports costs claimed as manufacturing, preparation, and/or transportation costs. All such records shall be maintained in lessee's accounting offices for future audit by lessor. Lessee shall maintain required records for 6 years after they are generated or, if an audit or investigation is underway, until released of the obligation to maintain such records by lessor.

During existence of this lease, information obtained under this section shall be closed to inspection by the public in accordance with the Freedom of Information Act (5 U.S.C. 552).

Sec. 6. Conduct of operations—Lessee shall conduct operations in a manner that minimizes adverse impacts to the land, air, and water, to cultural, biological, visual, and other resources, and to other land uses or users. Lessee shall take reasonable measures deemed necessary by lessor to accomplish the intent of this section. To the extent consistent with lease rights granted, such measures may include, but are not limited to, modification to siting or design of facilities, timing of operations, and specification of interim and final reclamation measures. Lessor reserves the right to continue existing uses and to authorize future uses upon or in the leased lands, including the approval of easements or rights-of-way. Such uses shall be conditioned so as to prevent unnecessary or unreasonable interference with rights of lessee.

Prior to disturbing the surface of the leased lands, lessee shall contact lessor to be apprised of procedures to be followed and modifications or reclamation measures that may be necessary. Areas to be disturbed may require inventories or special studies to determine the extent of impacts to other resources. Lessee may be required to complete minor inventories or short term special studies under guidelines provided by lessor. If in the conduct of operations, threatened or endangered species, objects of historic or scientific interest, or substantial unanticipated environmental effects are observed, lessee shall immediately contact lessor. Lessee shall cease any operations that would result in the destruction of such species or objects.

Sec. 7. Mining operations—To the extent that impacts from mining operations would be substantially different or greater than those associated with normal drilling operations, lessor reserves the right to deny approval of such operations.

Sec. 8. Extraction of helium—Lessor reserves the option of extracting or having extracted helium from gas production in a manner specified and by means provided by lessor at no expense or loss to lessee or owner of the gas. Lessee shall include in any contract of sale of gas the provisions of this section.

Sec. 9. Damages to property—Lessee shall pay lessor for damage to lessor's improvements, and shall save and hold lessor harmless from all claims for damage or harm to persons or property as a result of lease operations.

Sec. 10. Protection of diverse interests and equal opportunity—Lessee shall: pay when due all taxes legally assessed and levied under laws of the State or the United States; accord all employees complete freedom of purchase; pay all wages at least twice each month in lawful money of the United States; maintain a safe working environment in accordance with standard industry practices; and take measures necessary to protect the health and safety of the public.

Lessor reserves the right to ensure that production is sold at reasonable prices and to prevent monopoly. If lessee operates a pipeline, or owns controlling interest in a pipeline or a company operating a pipeline, which may be operated accessible to oil derived from these leased lands, lessee shall comply with section 28 of the Mineral Leasing Act of 1920.

Lessee shall comply with Executive Order No. 11246 of September 24, 1965, as amended, and regulations and relevant orders of the Secretary of Labor issued pursuant thereto. Neither lessee nor lessee's subcontractors shall maintain segregated facilities.

Sec. 11. Transfer of lease interests and relinquishment of lease—As required by regulations, lessee shall file with lessor any assignment or other transfer of an interest in this lease. Lessee may relinquish this lease or any legal subdivision by filing in the proper office a written relinquishment, which shall be effective as of the date of filing, subject to the continued obligation of the lessee and surety to pay all accrued rentals and royalties.

Sec. 12. Delivery of premises—At such time as all or portions of this lease are returned to lessor, lessee shall place affected wells in condition for suspension or abandonment, reclaim the land as specified by lessor and, within a reasonable period of time, remove equipment and improvements not deemed necessary by lessor for preservation of producible wells.

Sec. 13. Proceedings in case of default—If lessee fails to comply with any provisions of this lease, and the noncompliance continues for 30 days after written notice thereof, this lease shall be subject to cancellation unless or until the leasehold contains a well capable of production of oil or gas in paying quantities, or the lease is committed to an approved cooperative or unit plan or communitization agreement which contains a well capable of production of unitized substances in paying quantities. This provision shall not be construed to prevent the exercise by lessor of any other legal and equitable remedy, including waiver of the default. Any such remedy or waiver shall not prevent later cancellation for the same default occurring at any other time. Lessee shall be subject to applicable provisions and penalties of FOGRMA (30 U.S.C. 1701).

Sec. 14. Heirs and successors-in-interest—Each obligation of this lease shall extend to and be binding upon, and every benefit hereof shall inure to the heirs, executors, administrators, successors, beneficiaries, or assignees of the respective parties hereto.

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Form 3100-11
(June 1988)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

Serial No.

OFFER TO LEASE AND LEASE FOR OIL AND GAS

The undersigned *(reverse)* offers to lease all or any of the lands in Item 2 that are available for lease pursuant to the Mineral Leasing Act of 1920, as amended and supplemented (30 U.S.C. 181 et seq.), the Mineral Leasing Act for Acquired Lands of 1947, as amended (30 U.S.C. 351-359), the Attorney General's Opinion of April 2, 1941 (40 Op. Atty. Gen. 41), or the

READ INSTRUCTIONS BEFORE COMPLETING

1. Name
   Street
   City, State, Zip Code

2. This application/offer/lease is for: *(Check only One)* ☐ PUBLIC DOMAIN LANDS ☐ ACQUIRED LANDS (percent U.S. interest _____)
   Surface managing agency if other than BLM: _____ Unit/Project _____
   Legal description of land requested: *Parcel No.:_____ *Sale Date (m/d/y):_____ / _____ / _____
   ***SEE ITEM 2 IN INSTRUCTIONS BELOW PRIOR TO COMPLETING PARCEL NUMBER AND SALE DATE.**

T.	R.	Meridian	State	County

Total acres applied for _____

Amount remitted: Filing fee $ _____ Rental fee $ _____ Total $ _____

DO NOT WRITE BELOW THIS LINE

3. Land included in lease:

T.	R.	Meridian	State	County

Total acres in lease _____

Rental retained $ _____

This lease is issued granting the exclusive right to drill for, mine, extract, remove and dispose of all the oil and gas *(except helium)* in the lands described in Item 3 together with the right to build and maintain necessary improvements thereupon for the term indicated below, subject to renewal or extension in accordance with the appropriate leasing authority. Rights granted are subject to applicable laws, the terms, conditions, and attached stipulations of this lease, the Secretary of the Interior's regulations and formal orders in effect as of lease issuance, and to regulations and formal orders hereafter promulgated when not inconsistent with lease rights granted or specific provisions of this lease.

NOTE: This lease is issued to the high bidder pursuant to his/her duly executed bid or nomination form submitted under 43 CFR 3120 and is subject to the provisions of that bid or nomination and those specified on this form.

Type and primary term of lease:

☐ Noncompetitive lease (ten years)

☐ Competitive lease (five years)

☐ Other _____

THE UNITED STATES OF AMERICA

by _____
(Signing Officer)

_____ _____
(Title) (Date)

EFFECTIVE DATE OF LEASE _____

(Continued on reverse)

Form 3730-1
(July 1984)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

POWERSITE STIPULATION

The lessee or permittee hereby agrees:

(a) If any of the land covered by this lease or permit was, on the date the lease or permit application or offer was filed, within a powersite classification, powersite reserve, waterpower designation, or project on which an application for a license or preliminary permit is pending before the Federal Energy Regulatory Commission or on which an effective license or preliminary permit had been issued by the Federal Energy Regulatory Commission under the Federal Power Act, or on which an authorized power project (other than one owned or operated by the Federal Government) had been constructed, the United States, its permittees or licensees shall have the prior right to use such land for purposes of power development so applied for, licensed, permitted, or authorized and no compensation shall accrue to the mineral lessee or permittee for loss of prospective profits or for damages to improvements or workings, or for any additional expense caused the mineral lessee as a result of the taking of said land for power development purposes. It is agreed, however, that where the mineral lessee or permittee can make adjustments of his improvements to avoid undue interference with power development, he will be permitted to do so at his own expense. Furthermore, occupancy and use of the land by the mineral lessee or permittee shall be subject to such reasonable conditions with respect to the use of the land as may be prescribed by the Federal Energy Regulatory Commission for the protection of any improvements and workings constructed thereon for power development.

(b) If any of the land covered by this lease or permit is on the date of the lease or permit within a powersite classification, powersite reserve, or waterpower designation which is not governed by the preceding paragraph, the lease or permit is subject to the express condition that operations under it shall be so conducted as not to interfere with the administration and use of the land for powersite purposes to a greater extent than may be determined by the Secretary of the Interior to be necessary for the most beneficial use of the land. In any case, it is agreed that where the mineral lessee or permittee can make adjustments to avoid undue interference with power development, he will be permitted to do so at his own expense.

OR
Exhibit

Form 3109-2
(December 1970)
(formerly 3103-3)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

Serial Number

Name of Project

STIPULATION FOR LANDS UNDER JURISDICTION OF DEPARTMENT OF THE ARMY, CORPS OF ENGINEERS

The lands embraced in this lease issued under the Mineral Leasing Act of February 25, 1920 (41 Stat. 437; 30 U.S.C. 181 *et seq.*), as amended, or the Mineral Leasing Act for Acquired Lands of August 7, 1947 (61 Stat. 913; 30 U.S.C. 351 *et seq.*) being under the jurisdiction of the Department of the Army, Corps of Engineers, the lessee hereby agrees:

(1) That *all* rights under this lease are subordinate to the rights of the United States to flood and submerge the lands, permanently or intermittently, in connection with the operation and maintenance of the above-named project.

(2) That the United States shall *not* be responsible for damages to property or injuries to persons which may arise from or be incident to the use and occupation of the said premises, or for damages to the property of the lessee, or for injuries to the person of the lessee (if an individual), or for damages to the property or injuries to the person of the lessee's officers, agents, servants, or employees, or others who may be on said premises at their invitation or the invitation of any one of them arising from or incident to the flooding of the said premises by the Government or flooding from any other cause, or arising from or incident to any other governmental activities; and the lessee shall hold the United States harmless from any and all such claims.

(3) That the work performed by the lessee on the lands shall be under the general supervision of the District Engineer, Corps of Engineers, in direct charge of the project, and subject to such conditions and regulations as may be prescribed by him, and the plans and location for all structures, appurtenances thereto, and work on said lands shall be submitted to the said District Engineer for approval, in advance, of commencement of any work on said lands. The District Engineer shall have the right to enter on the premises, at any time, to inspect both the installation and operational activities of the lessee.

(4) That no structure or appurtenance thereto shall be of a material or construction determined to create floatable debris.

(5) That the construction and operation of said structures and appurtenances thereto shall be of such a nature as not to cause pollution of the soils and the waters of the project.

(6) That the United States reserves the right to use the land jointly with the lessee in connection with the construction, operation, and maintenance of the Government project and to place improvements thereon or to remove materials therefrom, including sand and gravel and other construction material, as may be necessary in connection with such work, and the lessee shall not interfere, in any manner, with such work or do any act which may increase the cost of performing such work. If the cost of the work performed by the Government at and in connection with the project, including work performed on lands outside the property included in the lease, is made more expensive by reason of improvements constructed on the leased property by the lessee, the lessee shall pay to the United States money in an amount, as estimated by the Chief of Engineers, sufficient to compensate for the additional expense involved.

Date

(Signature of Lessee)

OR
Exhibit

UNITED STATES
DEPARTMENT OF THE INTERIOR

Bureau of Land Management

Special Stipulation

By

Federal Energy Regulatory Commission

There will be no surface or subsurface occupancy, including but not limited to drilling of the lands lying within the boundary of the _____ _____Project (FERC Licensed Project No. _____), as shown on map Exhibit K sheets _____ _____(FERC Nos._____); however, oil and gas extraction may commence through wells drilled on adjacent lands if (1) the Deputy State Director for Mineral Resources determines that such extraction will not interfere with the above stated project, and (2) the project licensee (now_____of _____ _____) has no objection. This stipulation may be changed by the Federal Energy Regulatory Commission if (1) the Deputy State Director for Mineral Resources demonstrates to Federal Energy Regulatory Commission that surface or subsurface use would not interfere with the power project and that oil and gas operations could be conducted in a manner to adequately protect the project, or (2) the Deputy State Director for Mineral Resources requests that an objection by the licensee be overruled by the Federal Energy Regulatory Commission.

The lessee shall not in any manner intefere with the use of the lands for hydroelectric project purposes. Oil and gas operations will be discontinued at any time in which the Deputy State Director for Mineral Resources, the Federal Energy Regulatory Commission, or the project licensee perceives interference with any current or future hydroelectric project purpose and demands discontinuation. Operations may be resumed if (1) the demand for dicontinuation is withdrawn, or (2) the Federal Energy Regulatory Commission, upon request of the Deputy State Director for Mineral Resources overrules a demand by the project licensee.

It is understood and agreed that no compensation shall accrue to the oil and gas lessee for any expense, or loss of prospective profits, resulting from any use of the lands for hydroelectric project purposes.

Form 3120–2
(October 1965)
(formerly 4–1383)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

LEASE STIPULATION
WILDLIFE LANDS

INSTRUCTIONS

This form of stipulations is to be included in Oil and Gas Leases entered into pursuant to 43 CFR 192.9 relating to Oil and Gas Leases in Wildlife Refuge, Game Range, and Coordination Lands.

1. The following stipulations will be made a part of the Bureau of Land Management Lease Forms 3120–3 and 3200–2, and all substitutions therefor. These stipulations will be made applicable as terms and conditions of performance by lessees under all oil and gas leases entered into under authority vested in the Secretary of the Interior over game range, coordination or Alaska Wildlife lands pursuant to the order of the Secretary of the Interior published in 23 *Federal Register* 227, January 11, 1958, 43 CFR 192.9.

2. Should compliance with one or more of these terms and conditions be considered unduly burdensome and unnecessary to the protection of wildlife resources, the lessee may request waiver thereof by letter addressed to the Secretary of the Interior setting forth, in full, the reasons why a waiver is considered necessary. The authority to grant such waivers shall be discretionary and may be exercised only by the Secretary or the Under Secretary of the Interior.

3. The authorized officer shall (a) approve no plan of operation that contains provisions inconsistent with the stipulations hereinafter set forth; (b) waive no term or condition in a lease; or exercise no discretion vested in him unless he is satisfied the exercise of that discretion will not damage any wildlife resource.

4. Drilling and production operations under the lease shall be under the direction of the Geological Survey.

5. As used herein:

(a) the term "lessee" includes the lessee, heirs and assigns of the lessee and persons operating on behalf of the lessee;

(b) the term "wildlife resources" include fish and wildlife resources and concentrations, fish and wildlife management operations and range improvements and facilities;

(c) the term "authorized officer" means the State Director of the Bureau of Land Management in the State in which the land is located, and, in Alaska, the Refuge Manager of the Bureau of Sport Fisheries and Wildlife.

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1. The lessee shall:

(a) comply with all the rules and regulations of the Secretary of the Interior;

(b) prior to the beginning of operations, appoint and maintain at all times during the term of the lease a local agent upon whom may be served written orders or notices respecting matters contained in these stipulations and to inform the authorized officer in writing of the name and address of such agent. If a substitute agent is appointed, the lessee shall immediately inform the said representative;

(c) conduct all authorized activities in a manner satisfactory to the authorized officer with due regard for good land management and avoid damage to improvements, timber, crops, and wildlife cover; fill all sump holes, ditches, and other excavations or cover all debris; and, so far as reasonably possible, restore the surface of the leased lands to their former condition; and, when required, to bury all pipelines below plow depth. The authorized officer shall have the right to enter all the premises at any time to inspect both the installation and operational activities of the lessee;

(d) take such steps as may be necessary to prevent damage to wildlife;

(e) do all in his power to prevent and suppress forest, brush, or grass fires, and to require his employees, contractors, subcontractors and employees of contractors or subcontractors to do likewise;

(f) install adequate blow-out prevention equipment;

(g) construct ring dikes and sump pits to confine drilling mud and other pollutants and make safe disposition of salt water by use of injection wells or such other method as may be approved in the plan of operation;

(h) cover flare pits in areas of wildlife concentration;

(i) remove derricks, dikes, equipment, and structures not required in producing operations within 60 days after the completion of drilling;

(j) comply with and see to it that his agents and employees comply with all Federal and State laws relating to hunting, fishing, and trapping;

(k) commit the lease to any unit plan required in the interest of conservation of oil or gas resources or for the protection of wildlife;

(l) prior to the conduct of geological, geophyscial, or core drilling operations or construction of any facilities, or prior to operations to drill or produce, submit in *triplicate* for approval, in writing, by the authorized officer a plan of operation that will include detailed statements indicating the manner in which the lessee will comply with these stipulations together with a statement that the lessee agrees that compliance with these stipulations and with the approved plan of operations are conditions of performance under this lease and that failure to comply with these provisions *(unless they are waived by the Secretary or the Under Secretary of the Interior)* will be grounds for cancellation of the lease by the United States. Notwithstanding other provisions in these stipulations, the lessee shall include in any plan of operation specific provisions relating to: the time, place, depth and strength of seismographic shots, maps showing the location of his leases included in the plan, actual and proposed access roads, bunkhouses, proposed well locations, storage and utility facilities, water storage, pipelines and pumping stations; the type of safety equipment that will be employed; the methods to be used to assure the disposition of drilling mud, pollutants, and other debris; the location of facilities in relation to flood levels; and such other specific matters as the authorized officer may require. The plan of operation shall be kept current in all respects and all revisions and amendments submitted to the authorized officer for written approval;

(m)do all things reasonably necessary to prevent or reduce to the fullest extent scarring and erosion of the land, pollution of the water resources and any damage to the watershed. Where construction, operation, or maintenance of any of the facilities on or connected with this lease causes damage to the watershed or pollution of the water resource, the lessee agrees to repair such damage, including reseeding and to take such corrective measures to prevent further pollution or damage to the watershed as are deemed necessary by the authorized officer;

(n) file the bond required by Sec. 2a(4) of the lease before conducting any operations on the leasehold, and file any additional bond required by the authorized officer to pay for damages to wildlife habitat, including trees and shrubs, or wildlife improvements;

(o) agree to respect and comply with any new requirements imposed by the Secretary of the Interior, or the authorized officer, on the operating program as operating experiences proves necessary in order to give complete protection to wildlife populations and wildlife habitat on the areas leased.

2. The lessee shall not:

(a) construct roads, pipelines, utility lines, and attendant facilities that are either unnecessary or which might interefere with wildlife habitat or resources or with drainage;

(b) modify or change the character of streams, lakes, ponds, water holes, seeps, and marshes, except by advance approval in writing by the authorized officer nor shall he in any way pollute such streams, lakes, ponds, water holes, seeps, or marshes;

(c) conduct operations at such times as will interfere with wildlife concentrations;

(d) conduct geological or geophysical explorations that might damage any wildlife resource and such operations shall be conducted only in accordance with advance approval, in writing, by the authorized officer as to the time, manner of travel, and disturbances of surfaces and the facilities required for the protection of wildlife;

(e) use explosives in fish spawning or rearing areas, nesting areas, lambing grounds, or other areas of wildlife concentrations during periods of intense activity or at any other time or in any manner that might damage any wildlife resources; the pattern, size, and depth of seismographic shots shall be submitted to the authorized officer for advance approval in writing and immediately following the detonation of any seismographic charge, the hole shall be filled or plugged and any surface damage repaired to the satisfaction of the authorized officer;

(f) without advance approval, in writing, use any water or water source controlled or developed by the United States;

(g) use mobile equipment under such conditions as to permanently damage surface resources, cause scarring and erosion, or interfere with wildlife concentrations;

(h) conduct geological, or geophysical, or core drilling operations or construct roads, bunkhouses or any facilities or drill or produce under a lease until the submittal and approval in writing of a plan of operation pursuant to 1(l) above, or deviate therefrom until any revisions or amendments of said plan have been approved in writing by the authorized officer;

(i) burn rubbish, trash, or other inflammable materials or use explosives in a manner or at a time that would constitute a fire hazard.

GPO 853-423

Appendix C

Fluid Mineral Operations

I. Oil and Gas Leasing

The Mineral Leasing Act of 1920 (as amended), provides that all public lands be open to oil and gas leasing unless a specific land order has been issued to close the area. Through the Bureau's land use planning system, the availability of public land for leasing is analyzed and constraints on leasing and oil and gas operations are identified. Oil and gas leases are then issued from the Montana State Office in Billings.

The issuance of a lease authorizes the lessee to actively explore and/or develop the lease, guided by any attached stipulations. Stipulations serve to point out areas of special concern. Time, distance, and surface occupancy stipulations are common lease restrictions used to protect surface resources.

Occasionally, stipulations protecting the mineral resource from drainage or requiring the new lessee to assume responsibility for any unplugged wells on a lease are added to protect mineral resources.

Standard stipulations are included in the terms of all leases. The "Spokane District, BLM, Standard Mitigation Guidelines for Surface-Disturbing Activities" identify the basic criteria for applying these standard oil and gas lease stipulations. In addition, certain areas may be designated for special stipulations. These special stipulations would be attached, for those designated lands, prior to lease offering. Other site specific stipulations which are consistent with this RMP could be developed during the field office evaluation of proposed geophysical operations, Applications for Permit to Drill (APD), etc. Additional National Environmental Policy Act (NEPA) analysis and documentation would occur on the APDs as necessary.

Drilling and exploration activities on federal lands open to oil and gas leasing in the RMP planning area, are administered by the Border and Wenatchee Resource Area Offices, both under the guidance of the Spokane District Office. Much of the federal mineral estate administered by the BLM within the area of exploration interest involves surface estate management by other agencies and private surface ownership.

The RMP is limited to some extent by restrictions on lands involving surface management by other agencies. For instance, only some of the federal lands in the Hanford Reservation and Yakima Firing Center others are formally closed to leasing. Other lands at these sites are technically open to leasing, but both facilities have policies against allowing entry for mineral leasing and exploration on any of the lands. The RMP can review the effects of these restrictions, but changes in policy are subject to the other agencies

On lands open to leasing, restrictive (seasonal, timing, limited or no occupancy) stipulations may be needed to protect important surface resources such as wildlife habitat areas, special status plants, ACEC's, etc.

A federal lessee or operator is required to follow procedures set forth by Onshore Oil and Gas Orders, The Conservation Division Manuals (as amended), the Federal Oil and Gas Royalty Management Act (as amended) and Title 43 Code of Federal Regulations, Section 3100.

The following sections describe typical oil and gas operations for the Spokane RMP planning area.

II. Oil and Gas Exploration and Development

A. Preliminary Exploration

Hydrocarbon exploration occurs in unexplored portions of areas where hydrocarbons are known or thought to occur in commercial quantities.

An area where hydrocarbons are thought to occur in commercial quantities is known as a frontier or rank wildcat area. When prices for oil and gas supplies increase, it becomes profitable to explore for oil and gas in less promising geological provinces and in areas where the climate, terrain, depth of deposits, difficulty in drilling, and other obstacles have discouraged previous efforts. Increasingly sophisticated exploration techniques, improved oil and gas drilling, and transportation technologies have also enhanced prospects for locating, extracting, and marketing hydrocarbon resources.

B. Geological Exploration

Where the bedrock geology of an areas is well exploded, it is often possible to predict where hydrocarbons may occur. The potential traps (anticlines, faults, or formations with varying porosity) can sometimes be located with the aid of geologic maps, aerial photos, and landsat imagery. Occasionally, additional data will be gathered by aircraft. Low altitude reconnaissance flights, frequently at elevations of 100 to 500 feet, help identify rock outcrops that can be studied later on the ground. Next, on or more geologists may examine and

sample the rock outcrops in the area and map the surface geology. Geological exploration can be performed with little surface damage; four wheel drive pickups, motorcycles, or all terrain vehicles can be used to cover the area.

C. Geophysical Exploration

Exploration for oil and gas can involves direct and indirect exploration methods. Some direct exploration methods, such as the mapping of rock outcrops and oil seeps, are used to obtain data to identify areas favorable for oil and gas occurrences. Indirect methods, such as seismic, electromagnetic and gravity surveys are used to delineate subsurface features which may contain oil and gas. Actual oil and gas discoveries can only be made an proven through direct methods - drilling, drill core analyses and drill stem tests.

Subsurface geology is not always accurately indicated by surface outcroppings. In such cases, geophysical prospecting is used. Subsurface characteristics are measured indirectly by geophysical methods, including gravitational field, magnetic field, and seismic characteristics.

Gravitational prospecting detects micro-variations in gravitational attraction caused by the differences in the density of various types of rock through the use of an instrument known as a gravimeter. Data derived from gravity surveys is used to generate anomaly maps, from which faults and general structural trends can be interpreted.

Survey measurements are taken at many points along a linear path with a gravimeter. Gravitational and magnetic surveys involve small portable units which are easily transported via aircraft and light ground vehicles, such as four-wheel drive pickups and jeeps. Off-road vehicle traffic is common in these two types of surveys. Sometimes, small holes (approximately one inch by two inches by two inches) are hand dug for instrument placement along the survey lines.

Electric soundings measure the electromagnetic field induced in the earth by naturally or artificially induced electric currents. Magnetotelluric surveys measure very weak, naturally-induced electric currents using highly sensitive equipment. Vertical electric soundings measure fluctuations in artificially-induced electric currents relative to a stationary source. The fluctuations are converted to electrical resistivities, which can then be correlated against time and depth to interpret subsurface geologic formations.

Seismic surveys are the most popular indirect method currently used for locating subsurface structures which may contain oil and gases. Seismic prospecting is based on the fact that shock waves (waves similar to those created when a pebble is dropped into a pool of standing water) are reflected and refracted (bent) to varying degrees and travel at different speeds as they pass through different rock types. As the shock wave encounters layers where the lower rock unit causes the waves to travel slower, some of the wave (energy) is reflected upward to surface sensing devices called geophones.

The common procedure used in seismic surveys on land consists of creating shock waves and recording, as a function of time, the resultant seismic energy as is arrives at groups of vibration detectors (one-half to five pound seismometers, or "jugs" arrayed on the ground at spaced intervals). These arrays of seismometers are connected by ground wire to a data recorder truck that receives and records the reflected seismic energy on magnetic tape.

The seismic sensors and energy source are located along lines on a one to two mile grid. Surveys may be laid out in excess of 40 miles in a series of grid patterns or in a single line.

In remote areas where there is little known subsurface data, a series of short seismic lines may be required to determine the characteristics of the subsurface formations. After this, seismic lines would be aligned to make seismic interpretations more accurate. Although alignment may be fairly critical, spacing of the lines can often be changed up to a quarter of a mile on a one-mile grid before the results will affect the investigation program. This allows some adjustment for existing or alternate access of lines.

Seismic methods are usually referred to by the various methods of generating the shock wave. The shock waves are generated by a small explosion (above the surface, or within a shallow drill hole) or mechanically by vibrating (vibroseis) or thumping (dropping a heavy weight) the ground surface.

The vibroseis and thumper methods typically involve large trucks equipped with pads about 4-foot square. The vibrator method is widely used and is replacing the explosive and thumper methods in accessible areas. In the thumper method, the pad is a steel slab weighing several tons which is attached by cables to a crane on a special truck. This slab is dropped to the ground several times in succession along a predetermined line. In the vibroseis method, the pads are lowered to the ground and the vibrators are electronically triggered from the recording truck. Once information is recorded, the trucks move forward a short distance and the process is repeated. Because the process is essen-

tially continuous, the overall movement of the trucks effects a strip about eight to ten feet wide, and up to twenty miles long.

The spark ignition method can be used with a variety of vehicles. It consists of a bell-shaped chamber mounted underneath a vehicle. The seismic energy is imparted to the ground through the spark ignition of a propane and oxygen mixture confined in the chamber. Although this is essentially an explosive-type process, the methods and equipment are more similar to thumper/ vibratory systems.

The above referenced methods have similar surface-disturbing factors in common. Where possible, existing roads are used to conduct seismic operations. Most lines which run where no roads exist are not bladed except at wash crossings. Vehicles travel overland and, if necessary, are towed by a bulldozer through rough spots or in sandy areas. Some lines may require clearing of vegetation and loose rock to improve access for trucks. Completely clearing a seismic line is unusual.

Generally, the methods involve eight to twenty energy source trucks (usually weighing two and one-half to ten tons each) plus the recording truck and cable trucks or pickup trucks. Depending on the type of survey, the vehicles may travel off-road along a single two lane trail made by the trucks or the vehicles may make up to a half dozen parallel trails. Travel along the line (trails) is usually a matter of one or two passes by the vehicle since the energy source is mobile and recording is done as the vehicles move down the line.

Historically, explosives have been the most widely used way to generate seismic shock waves. Subsurface and surface explosives are used. In the subsurface explosive method, small-diameter holes for the charges are drilled to depths of 100 to 200 feet by truck-mounted or air portable drills. The hole is usually two to six inches in diameter. Generally 4 to 12 holes are drilled per mile of line and a 50-pound charge of explosives is placed in the hole, covered, and detonated. A special method has been used by the U.S. Geological Survey for very deep surveys, involving charges of up to 1,000 pounds per hole. Access suitable to the travel of drill and recording trucks across the surface is desirable. The created shock wave is recorded by geophones placed in a linear fashion on the surface. In rugged topography, a portable drill carried in by helicopter is often used to drill the holes rather than a truck-mounted drill.

Detonation of the charge in some areas causes no surface disturbance, while in other areas, a small crater up to six feet in diameter is created. Cuttings from the well are normally hauled to a suitable disposal site, scattered by hand near the "shot hole", or put back in the shot hole afterwards. Bentonite clay is often used to plug the shot hole. The same hole may be reloaded and shot several times to find the depth and charge returning the best signal.

The vehicles used for a drilling program may include heavy (15 to 20 tons) truck-mounted drill rigs, track mounted air rigs, water trucks, a computer recording truck, and several light pickups for the surveyors, shot hole crew, geophone crew, permit man, and party chief. As with other truck transported operations, existing roads may be used or trails may be blazed by the drill vehicles and/or a bulldozer. A truck-mounted drill and shot operation generally takes longer to complete and requires more trips by vehicles along a line (drill service equipment) than do vibrator and thumper operations.

Where access limitations, topography, or other restraints prevent use of truck-mounted drill rigs or recording trucks, light weight portable drill equipment can be used. Various kinds of portable drills can be backpacked or delivered by helicopter to the area. These portable operations use a pattern of holes drilled to a depth of about 25 feet. The holes are loaded with explosives and detonated simultaneously.

The surface charge method involves placing 2 1/2 or 5 pound charges directly on the ground, on snow, or on a variety of stakes and platforms. Paper cones, survey stakes, lathes, or 2 x 4's up to eight feet in length have been used with varying success in different areas. This type of charge results in the destruction of above ground vegetation, but this damage is usually undetectable after several growing seasons. The disadvantage of this type charge is its limited depth of shock wave penetration, and there is increased risk to the seismic crew personnel. Surface explosive methods are very mobile. Generally, four-wheel drive vehicles are used for transportation, although the equipment can be airlifted to the site or packed in on foot.

A given area may be explored several times by the same or different companies over a long period of time. Multiple exploration is undertaken because first attempts were unsuccessful, another company wants its own information, or new or different techniques and/ or equipment are used.

A typical seismic operation of eight or more trucks may require a crew of 60 people, including maintenance and administrative personnel at the field station. Under normal conditions, about 20 miles of line can be surveyed each month using the vibroseis, thumper or explosive methods.

Public roads and existing private roads and trails are used where possible. However, off-road cross-country travel is also necessary in some cases. Graders and dozers may be required to provide access to remote areas, but these methods are rarely used. Several trips a day are made along a seismograph line; this usually establishes a well defined 2-track trail. Drilling water, when needed, is usually obtained from private landowners.

Terrain along the Spokane RMP region is of the type which allows the use of thumpers or vibroseis trucks. Therefore, geophysical exploration in this region should be accomplished with minimal surface disturbance.

Geophysical operations may be conducted on leased or unleased federal land. Notices to conduct geophysical operations on BLM surface are received by the appropriate resource area. Administration and surface protection are accomplished through close cooperation of the operator and the BLM. Seasonal restrictions may be imposed to reduce fire hazards, conflicts with wildlife, watershed damage, hunting activity, etc.

An operator is required to file a "Notice of Intent to Conduct Oil and Gas Exploration Operations" for all geophysical activities that are not considered to be casual use on public lands administered by the BLM. The Notice of Intent, includes maps showing the line location and access routes, any anticipated surface damages and a time frame for operations. The operator must be bonded for all off-road vehicle operations. In some instances, typically on private surface estate or on surface estate managed by another federal agency, the operator may choose to file a "Sundry Notice" as a lessee to conduct geophysical operations on a federal lease.

Written approval must be obtained prior to commencing any surface blading activities and the operator must contact the BLM when operations begin. The operator is required to comply with written instructions and orders given by the Authorized Officer at the prework conference, site inspection (if required) and during field investigations. Periodic checks during and upon completion of the operation are conducted by the BLM to ensure compliance with the terms of the Notice of Intent (or Sundry Notice).

D. Drilling Permit Process

Notices of Staking, Applications for Permit to Drill, drilling activities and subsequent well operations can only be approved, subject to regulations, on leased lands. When preliminary investigations are favorable and warrant further exploration, exploratory drilling may be justified. The federal lessee or operating company selects a drill site based on spacing requirements, subsurface and surface geology, geophysics, topography, and economic considerations.

E. Notice of Staking (NOS)

Once the company makes the decision to drill, they must decide whether to submit a Notice of Staking (NOS) or apply directly for a permit to drill. The NOS is an outline of what the company intends to do, including a location map and sketched site plan. The NOS is used to review any conflicts with known critical resource values. The BLM utilizes information contained in the NOS and obtained from the onsite inspection to develop stipulations to be incorporated into the APD. As a result of the Federal Onshore Oil and Gas Leasing Reform Act of 1987 (Reform Act of 1987), upon receipt of an NOS the operator/company name, well name/number, well location and a map showing the drill site must be posted in a public place in the Bureau approving office and the Bureau Resource Area Office or the local surface management agency office for a minimum of 30 days prior to approving the APD.

F. Application for Permit to Drill (APD)

The operator may or may not choose to submit an NOS; in either case, an Application for Permit to Drill must be submitted. An APD consists of two main parts: the 13 point surface plan which describes any surface disturbances and is reviewed by resource specialist, and the eight point plan which details the drilling program and is reviewed by the petroleum engineer and geologist. For the APD option the onsite inspection is used to assess possible impacts and develop stipulations to minimize these impacts. If the NOS option is not utilized the 30 day posting period as required by the Reform Act of 1987, will commence upon receipt of the APD by the BLM. Drilling procedures on wells must address ground water protection.

In the Spokane RMP region, an archaeological clearance is required for all drill sites. However, there may be exceptions to this policy on a case by case basis. Additionally, the BLM must prepare any site specific environmental documentation required by NEPA and develop mitigation measures necessary to protect any adversely affected resources. The BLM approves all wells drilled on federal minerals regardless of surface ownership, except on National Forest Lands where the BLM only approves the eight point drilling program. The BLM also approves wells drilled on leased Indian tribal or allotted lands, but has no control over Indian leasing decisions. For privately

owned surfaces it is the responsibility of the operator to obtain a surface owner agreement.

G. Exploratory Drilling

Nationally, about one in 16 wildcat wells produces significant amounts of oil or gas. Although there have been substantial gas shows in a number of recent wells in the planning area, none have been considered commercial shows.

Once the APD is approved, the operator may begin construction activities. When a site is chosen that necessitates the construction of an access road the length will vary, but usually the shortest feasible route is selected to reduce the haul distance and construction costs. Environmental factors or a landowner's wishes may dictate a longer route in some cases.

During this first phase the operator moves construction equipment over existing roads to the point where the access road begins. Although access roads are frequently already available to or close to drill sites, some access road construction or upgrade is usually needed. Depending upon the type of terrain, equipment may include dozers (track-mounted and rubber-tired) scrapers and graders. Existing roads and trails often require improvement in places to provide the 16-18 ft. wide driving surface needed, and occasionally culverts and cattle guards are installed. The total acreage disturbed varies considerably with the steepness of the slope.

The second phase is the construction of the drilling pad or platform. Due to the depth of the holes, preparing a drill pad is mandatory. In addition to excavating a mud (reserve) pit and cellar is required, a concrete foundation may be required for the drilling rig. The initial step in site preparation involves removing soil material suitable for plant growth and stockpiling it in a designated area, to be used later for rehabilitation and reseeding. Drilling sites on ridge tops and hillsides are constructed by cutting and filling portions of the location after the topsoil has been removed. The majority of the excess cut material is stockpiled in an area that will allow it to be easily recovered for rehabilitation. It is important to confine extra cut material to a stockpile so that it can be recovered for rehabilitation of the drill site.

Based on geophysical data and drilling results within the past ten years, minimum depths of 10,000 ft. are typically required to penetrate the surface cover of basalt, and most wells have been permitted initially for 15,000 feet. The amount of level surface required for safely assembling and operating a drilling rig varies with the type of rig, but is usually 400 feet by 400 feet for typical wells of 15,000+ foot depths (up to five acres, including the access road). Deeper wells require larger pads because of the rig size and associated equipment. When construction of a drilling location requires cut and fill, the foundation of the drilling derrick is usually placed on a cut surface ensuring that it rests on solid ground, thereby preventing it from leaning or toppling due to settling of uncompacted soil.

In addition to the drilling platform, a reserve pit is constructed. The reserve pit is used to contain the drilling fluids and drill hole cuttings. It is usually square or oblong, but is sometimes constructed in other shapes to accommodate topography. Generally, the reserve pit is up to 15 feet deep, but may be deeper to compensate for smaller length and width for deeper drilling depths. In some instances mud tanks may be utilized, thus eliminating the need for a pit.

Depending on how the drill site is located relative to a natural drainage, it may be necessary to construct water bars or diversions to control surface runoff and erosion. The area disturbed for construction and the potential for successful revegetation depends largely on topography, soil type, climate and the degree of disturbance.

The rigs are very large and may be moved in pieces. Moving a dismantled rig involves use of heavy trucking equipment for transportation, and crews to erect the rig. Gross weight of vehicles may run in excess of 80,000 lbs. A crane may be required to assist in "rigging up", or assemblying, the drill rig. Usually drilling activities begin shortly after the location and access road have been constructed. Water for drilling is hauled or piped to the rig storage tanks or reserve pit from rivers, wells, reservoirs or private sources. Occasionally, water supply wells are drilled on or close to the drill site.

Bentonite, a type of clay, is mixed with the water to form the main constituent of the drilling mud. A wide variety of other materials and chemicals may be added to enhance the mud properties. Drilling mud performs several important functions; it cools the bit, reduces the drag of the drill pipe on the sides of the bore hole, seals off any porous zones, aids in preventing an uncontrolled release of formation fluids, and carries the cuttings to the surface. High pressure air is sometimes used in place of mud. The use of mud or air is largely dependent upon the target formation, drilling depth and type of completion desired.

The drilling mud or air is circulated through the drill pipe to the bottom of the hole, through the bit and up the well bore. At the surface the mud and rock cuttings are returned to the reserve pit where gravity separates

the two or they are mechanically separated through a screen. The mud is recycled and returned to the system for further use. When drilling with air the cuttings are blown into the reserve pit. Various additives are used in maintaining the drill mud at the appropriate viscosity and weight. Some of the additives are caustic, toxic, or acidic, but these hazardous additives are used in relatively small amounts during drilling operations.

The mud is the first line of defense against possible blow-out, since it is used to control pressure. It is for this reason that a pit full of "reserve" mud (the reserve pit) is maintained on location. The reserve mud is used in emergencies to restore the proper drilling environment when radical or unexpected changes in downhole pressure is encountered.

The actual commencement of the drilling is referred to as "spudding in". A short piece of tubing called conductor pipe is forced into the ground (sometimes with a piledriver), and cemented in place. This keeps surface sand and dirt from sloughing into the well hole.

Next the regular drill bit and drill string (the column of drill pipe) take over. These pass vertically through a heavy steel turntable (the rotary table) on the derrick floor and the conductor pipe. The bit exerts a controlled pressure on the rock surface and is rotated by the drill string. The rig structure and associated hoisting equipment bear the remainder of the drill string's weight.

The weight on the bit is controlled to maintain as vertical a hole as possible or deviate from vertical when desired, and to prevent rapid wearing of the drill bit. The combination of rotary motion and weight on the bit causes rock to be chipped away at the bottom of the hole. As mentioned earlier, these chips are then transported to the surface where they are disposed of into the reserve pit.

The rotary motion is created by a square or hexagonal rod, called a kelly, which fits through a square or hexagonal hole in a large turntable, called a rotary table. The rotary table is geared to one or more engines, and rotates the drill string and bit. The rotary table sits on the drilling rig floor and as the hole is deepened the kelly descends. When the kelly has gone as deep as it can, it is raised and a piece of drill pipe about 30 feet in length is attached to the drill pipe in the hole. The drill pipe is then lowered, the kelly is raised and attached to the top of it, and drilling recommences. As the bit bores deeper into the earth, the drill string is lengthened by adding more pipe to the upper end.

Initially, the drilling usually proceeds rapidly due to the unconsolidated nature of shallow formations. Once the hole reaches a depth of several hundred feet, another string of pipe (the surface casing), is set inside the conductor pipe and cemented in place by pumping cement between the casing and hole wall. Surface casing acts as a safety device to protect freshwater zones (aquifers) from drilling fluid contamination. Surface casing should be set to a depth greater than the deepest fresh water aquifer which could reasonably be developed. Fresh water may exist at greater depths, but these aquifers are not normally considered to be important fresh water sources.

To prevent the well from "blowing out" in the event the drill bit hits a high pressure zone, "blowout preventor" (large metal rams) are installed around the surface casing just below the derrick floor. These rams will close around, clamping the drill string and sealing the well in the event of a blowout.

After setting the surface casing, drilling resumes using a smaller diameter bit, several strings of casing (intermediate casing) may be run (installed) before the well reaches the objective depth (total depth or "T.D."). Surface casing is large enough to allow subsequent lengths of these smaller casing strings to be set as the well is drilled deeper. Cement is placed in the annulus of the surface casing from casing shoe to ground level. That is, the entire space between the outside of the casing and the borehole wall is filled. Generally, only the bottom few hundred feet of intermediate or production casing is cemented, which often leaves several thousand feet of open hole behind some casing strings. Casing in open hole (uncemented annulus) is not considered adequate to protect zones of fresh water or minerals from contamination. The annulus must be properly filled with cement to provide adequate protection from interzonal migration.

Eventually, the bit becomes worn and must be replaced. To change bits, the entire string of drill pipe must be pulled from the hole. Once the bit is replaced the drill string is reassembled, lowered into the hole and drilling is started again.

Drilling operations are continuous, 24 hours a day, 7 days a week. The crews usually work three 8-hour shifts or two 12-hour shifts a day. Typical wells may have a drill rig on site for six to twelve months, although some wells may be completed within as little as three months. At periodic intervals, BLM drilling inspectors will conduct inspections of the drilling rig and operations to ensure compliance with the approved plans in the APD. If at any time the operator wishes to change the approved plans in the APD,

verbal approval may be obtained, but must be followed up in writing.

During drilling, the cuttings are separated from the mud and sampled so that geologists can note and analyze (log) the various strata through which the bit is passing. The rest of the cuttings pass into the reserve pit as waste. During or at completion of drilling activity, the well is "logged". Logging means measuring with geophysical instruments the physical characteristics of the rock formations and associated fluids through which the borehole passed. These instruments are lowered to the bottom of the well, and slowly raised to the surface while recording data.

Upon completion of drilling, the well is tested to determine its capability to produce hydrocarbons (oil and gas) by a measuring procedure called a drill stem test, in which pressures are recorded and fluid samples taken from zones of interest. After studying the data from those logs and tests, the geologist and/or petroleum engineer decide if the well will produce hydrocarbons.

If the well did not encounter oil and gas, it is plugged with cement and abandoned. The well pad and access road are recontoured and revegetated. Currently, the operator is only required to cement off "hydrocarbon bearing zones." Generally, operators define these to be zones which produce enough oil or gas to measure, therefore, some hydrocarbon bearing zones are not cemented. Production casing or liner is intended to provide a conduit for the production of oil and gas so that little or no product is lost in "up-hole zones".

If oil or gas is found in commercial quantities the well is completed as a producer. Casing is run to the producing zone and cemented in place. A proper cementing of the production casing string is required to provide coverage and prevent interzonal communication between oil and gas horizons and usable water zones. The drill rig is usually replaced by a smaller rig that is used for the final phase of completing the well. The equipment installed on the casing of a producing well consists of various valves and pressure regulators which are used to control the oil or gas flow to production facilities.

Typical exploration targets in the Spokane region involve gas resources. Gas shows in this region are mostly "sweet gas" wells, that is, they contain no hydrogen sulfide gas. Sweet gas production would require a meter house and a gathering line or marketing line to transport the gas. In some cases a compressor station is required to compress the gas to a pressure necessary for entry into a pipeline.

H. Development

If a wildcat well becomes a discovery well (a well that yields commercial quantities of oil or gas), development wells will be drilled to confirm the discovery, to establish the extent of the field, and to efficiently drain the reservoir. The procedures for drilling development wells are about the same as for wildcats, except that there is usually less subsurface sampling, testing, and evaluation.

If oil is encountered and formation pressure can raise oil to the surface, the well will be completed as a flowing well. Several downhole acid or fracture treatments to enhance the formation permeability may be necessary to make the well flow. A free-flowing well is simply closed off with an assembly of valves, pipes, and fittings (called a Christmas tree) to control the flow of oil and gas to other production facilities. A gas well may be flared for a short period to measure the amount of gas per day the well can produce, then shut in or connected to a gas pipeline. Pipeline quality gas at the wellhead requires a minimum of processing equipment. As the quality of gas decreases with the increased presence of water, dissolved solids, or liquid hydrocarbons, the amount of processing equipment increases. Water or liquid hydrocarbons in the gas are removed, usually at the wellhead, before the gas is mixed with other gas.

If the well is not free-flowing, it will be necessary to use artificial lift (pump) methods. After a pump is installed, the well may be tested for days or months to see if it is economically justifiable to produce the well and to drill additional development wells. During this phase, more detailed seismic work may be run to assist in precisely locating the hydrocarbon reservoir and to improve previous seismic work.

As with wildcat wells, field development well locations are surveyed. Statewide spacing regulations established by the Washington Oil and Gas Conservation Committee generally limit production wells to one gas well per 640 acres or one oil well per 40 acres. Exceptions to spacing requirements involving federal lands may be granted after a BLM review.

If liquid hydrocarbons (condensates) are produced with the gas a separator and storage facility are necessary. Gas wells which produce water require a small (10 by 10 foot) water disposal pit. Sour gas wells (those which produce hydrogen sulfide gas) require special wellhead equipment due to the corrosive nature of the hydrogen sulfide. The sour gas may be treated to remove any hydrogen sulfide prior to entry into a sales pipeline, but in most cases is sold to a gas plant for treatment.

Installation of production facilities generally requires little additional surface disturbance beyond that necessary for drilling. If necessary, a permanent road system can be designed and built. Because it often takes several years to develop a field and determine field boundaries, the permanent road system is usually built in segments.

However, additional disturbance does result from pipeline and gathering line installations. Gas meter houses might involve 10 by 10 foot skid-mounted, steel sheds. The gas house would usually be situated over the well head on the same area where the drill rig was set up. Water disposal pits needed for the evaporation of water produced in association with hydrocarbons generally fit within the boundaries of the drilling pad.

Natural gas pipelines transport gas from the wells (gathering or flow lines) to a trunk line, then to the main transmission line from the area. Flow lines are usually two inches to four inches in diameter and may or may not be buried. Trunk lines are generally six inches to eight inches in diameter and are buried, as are transmission lines which vary in diameter from ten inches to 36 inches. The area required to construct a pipeline varies from about 15 inches wide (for a two inch to four inch surface line) to greater than 75 feet for the larger diameter transmission lines (24 inches to 36 inches). Surface disturbance is primarily dependent on size of the line and topography of the area on which the line is being constructed.

Compressor stations may be necessary to increase production pressure to the same level as pipeline pressure. The stations vary in size from approximately one acre to as much as twenty acres for a very large compressor system.

After the production facilities are installed the remaining drilling disturbances are reclaimed. During the production phase, BLM monitors and approves field activities needed for well and field operation and regulation. Many operations, e.g. plugging, completion in a different zone, deepening, etc., require prior approval. Others such as acidizing and fracturing do not require prior approval, but a subsequent report of operations describing the operation in detail must be filed.

Surface use in an oil and gas field may be affected by unitization of the leaseholds. In many areas with federal lands, an exploratory unit is formed before a wildcat is drilled. The boundary of the unit is based on geologic data. The developers unitize the field by entering into an agreement to develop and generate it as a unit, without regard to separate ownerships. Costs and benefits are allocated according to agreed terms.

Unitization reduces the surface-use requirements because all wells are operated as though on a single lease. Duplication of field processing facilities is minimized because development operations are planned and conducted by a single unit operator, often resulting in fewer wells.

The rate of development well drilling depends on whether the field is operated on an individual lease basis or unitized, the probability of profitable production, the availability of drilling equipment, protective drilling requirements (drilling requirements to protect federal land from subsurface hydrocarbon drainage by off-setting nonfederal wells), and the degree to which limits of the field are known. If the discovery well has a high rate of production and substantial reserves, development drilling usually proceeds at a fairly rapid pace. If there is some question whether reserves are sufficient to warrant additional wells, development drilling may occur at a much slower pace. An evaluation period to observe production performance may follow between the drilling of successive wells.

Development on an individual lease basis usually proceeds more rapidly than under unitization, since each lessee must drill his own well to obtain production from the field. On a unitized basis, however, all owners within the participating area share in a well's production regardless of whose lease the well is on. Spacing requirements are not applicable to unit wells. The unit is developed on whatever the operator considers to be the optimal spacing pattern to maximize recovery.

Drilling in an undeveloped part of a lease to prevent drainage of hydrocarbons to an offset well on an adjoining lease (protective drilling) is frequently required in fields of intermingled federal and privately owned land. The terms of federal leases require such drilling if the offset well is on nonfederal lands, or on federal lands leased at a lower royalty rate.

I. Plugging and Abandonment

The BLM is responsible for the protection of federal minerals, regardless of the surface management agency or private ownership of the surface. Federal minerals plugging programs are designed to prevent fluid migration between zones, protect mineral resources from damage, isolate producing zones, and restore the surface area.

If the well is not productive in commercial quantities it is considered a dry hole. Dry holes and producing wells which can no longer produce in commercial quantities or have no other beneficial use must be plugged and abandoned. The procedures include measures to protect good quality ground water from contamination

by hydrocarbons or poorer quality water. Because each well is different, the plugging program for that well must be carefully designed.

The first step in the plugging and abandonment process is the filing of the Notice of Intent to Abandon (NIA). This will be reviewed by both the Surface Management Agency (SMA) and the BLM District Office. The NIA must be filed and approved prior to plugging a past producer. Verbal plugging instructions can be given for plugging current drilling operations, but a NIA must be filed after the work is completed. If usable fresh water was encountered while the well was being drilled, the SMA will be allowed, if interested, to assume future responsibility for the well and the operator will be reimbursed for the attendant costs.

The operator's plan for securing the hole is reviewed to insure it meets minimum requirements. In open hole situations, cement plugs must extend at least 50 feet above and below zones with fluid which has the potential to migrate, zones of lost circulation (this type of zone may require an alternate method to isolate), and zone of potentially valuable minerals. Thick zones may be isolated using 100-foot plugs across the top and bottom of the zone. In the absence of productive zones and minerals, long sections of open hole may be plugged with 100-foot plugs placed every 2,500 feet.

In cased holes, cement plugs must be placed opposite perforations and extending 50 feet above and below, except where limited by plug back depth. Any annular space that extends to the surface must be plugged with a minimum of 100-feet of cement to the surface. A cement plug of at least 50 feet but not less than 25 sacks of cement, must be placed in the smallest casing extending to the surface. Any plugs with questionable integrity (stability) must be tagged (tested). Each of the intervals between the plugs must be filled with mud of sufficient density to balance the plugs and ensure continued integrity of the well bore.

A permanent abandonment marker is required on all wells unless otherwise requested by the SMA. This marker pipe is usually at least 4 inches in diameter, 10 feet long, 4 feet above the ground, and embedded in cement. The pipe must be capped and permanently inscribed with the well identify and location.

After the physical plugging is completed, the surface is reclaimed, per stipulations in the APD or the surface owner agreement. The SMA is responsible for establishing and approving methods for surface rehabilitation and determining when this rehabilitation has been satisfactorily accomplished. At this point, the Subsequent Report of Abandonment can be approved.

J. Issuance of Rights-of-Way

Rights-of-way are required for all facilities, tank batteries, pipelines, truck depots, powerlines, and access roads that occupy federally owned land outside the lease or unit boundary. When a third party (someone other than the oil or gas company and the federal government) constructs a facility or installation on or off the lease, a right-of-way is also required.

III. Reasonably Foreseeable Scenario for Exploration and Development Potential

Economic conditions dramatically affect drilling activity, and at the present time oil and gas markets are depressed. However, an upturn in the petroleum market could create a significant increase in the number of drilling wells within the planning area as a great portion of the area has moderate to high oil and gas potential. The following sections briefly describe the planning areas historical, present and reasonably foreseeable oil and gas activity.

A. Prospectively Valuable for Oil and Gas

Most of the land within the Columbia Basin is classified as prospectively valuable (PV). PV criteria include a minimum thickness of 1,000 feet of sedimentary rocks at depths no greater than 35,000 feet below the surface, a favorable structural setting, and direct or indirect evidence of oil and gas potential, such as oil seeps, oil and/or gas shows in test wells, past or present production, seismic information, similarity with known producing rocks, or acceptable levels of thermal maturation.

B. Oil and Gas Potential

Oil and gas potential rating criteria are described in Table C-1, and are the basis for the ratings described on associated tables in Chapter 2. In general, areas defined by the USGS as a play and some surrounding PV lands are considered to have high potential. Areas marginal to these sites which meet criteria for classification as prospectively valuable (PV) for oil and gas are rated as moderate potential. Areas not designated as PV generally are rated as having low to no potential.

C. Historical and Current Background

The Spokane RMP planning area has a long history of sporadic oil and gas exploration and development. The only production to date from the planning area has been from a shallow, low pressure reservoir in Miocene basalt at the Rattlesnake Hills gas field. This gas

probably originated from underlying coal interbeds within the upper 5,000 feet of basalt. More recent exploration has focused on deeper gas deposits underlying the basalt. Table C-2 lists, by county, the drilling activity within the Spokane RMP planning area. Figure C-1 and Figure C-2 illustrate the trends in long term activity toward deeper exploratory wells.

The Rattlesnake Hills gas field, located on a faulted anticline in the Hanford Reservation, was accidentally discovered in 1913 when a well drilled for water encountered gas at about 700 feet. The flow of gas ranged from 70,000 to 500,000 cubic feet per day under about 5.5 to 7 pounds per square inch pressure. Field development was delayed until 1929, during which time a billion or more cubic feet of gas escaped to the atmosphere from several wells, lowering field pressure to 2 psi. After development of sixteen wells, this field yielded another billion cubic feet of gas in commercial production and about 270 million cubic feet of gas in field tests. Production came from zones 700 to 1,200 feet deep. Most wells flowed about 100,000 cubic feet per day, and the maximum flow was about 3 million cubic feet per day. Forty-eight miles of pipeline supplied gas to seven towns in the Yakima Valley. The Rattlesnake Hills field was abandoned in 1941 and is currently inactive. This field covered about 4,000 acres.

Most early exploration was for oil because of it's higher value, and, except for wells associated with the gas field, wells with shows of gas were considered to be of little or no value. Serious exploration continued through the 1920's and 1930's, but these early exploration companies thought that the basalt cover was, at most, only a few thousand feet thick. This view changed as continually deeper wells failed to penetrate the basalt.

The next exploration surge was in the mid-1950's, triggered by the Suez Canal crisis in 1956, but activity dropped off when the wells failed to make a discovery. Exploration was expensive, and complicated by the difficulty in obtaining accurate data below the basalt. Seismic methods generally did not penetrate the basalt, and magnetotelluric methods gave only approximations of sediment thicknesses under the basalt.

The most recent surge began in the 1970's in response to increased demand and price for natural gas as a result of the Arab oil embargo. Intensive studies of the Columbia River basalt conducted by the Department of Energy during its evaluation of the proposed Basalt Waste Isolation Project greatly increased the amount of geological information on this area, indirectly assisting the exploration effort. Prices in the gas market softened in the early 80s because of the number of gas wells completed in the United States, resulting in less exploration and drilling for gas nationwide. Despite this decline, exploration in the Washington frontier area continued as companies sought potentially "giant" fields. The gas glut is still with us at present, but the wells drilled in the early 70s will start to decline in production and drilling should pick up again in the future.

During the most recent surge, wells finally began to penetrate the basalt cover and collect data on the underlying formations. This may lead to better future interpretations of the geology. Several wells drilled in the 1980's had promising shows of gas. For instance, wells in the Yakima Canyon had flows of over 500,000 cubic feet per day, and a well on Saddle Mountains had flows of up to 3.1 million cubic feet per day. However, due to the high drilling costs, and the projected cost for completion and pipeline construction, the wells were considered noncommercial and abandoned.

There are several pipelines in the planning area which were developed to transport gas from out-of-state sources to and through Washington. The pipelines run from the Spokane area to the Tri-Cities region, then westward along the Columbia River to Oregon. A spur pipeline extends northwestward from the Tri-Cities to Yakima, Ellensburg and Wenatchee, Washington. Another pipeline extends westward from Idaho in the vicinity of Clarkston, Washington to Ritzville, Washington. The pipeline capacity from Spokane to Oregon may be increased in the 1990's along the existing route to accommodate additional supplies from Canada.

D. Present Activity

Presently, exploration in the Columbia Basin is at a standstill. Low prices, high exploration costs, restrictive surface management practices on federal and state lands, and lack of discoveries from recent drilling efforts have discouraged additional work by the most active exploration companies. Other companies have expressed interest in leasing and exploration work, but leasing of federal lands is on hold pending completion of the RMP.

E. Reasonably Foreseeable Future Scenario

Based on the preceding analysis of past and current oil and gas activities and trends, the following is a description of the reasonably foreseeable oil and gas exploration and development activity anticipated in the Spokane RMP area over the next 10 to 15 years.

1. Geophysical Exploration

Geophysical work reached a peak in 1986, when the State processed applications for 568 miles of vibroseis

Figure C-1

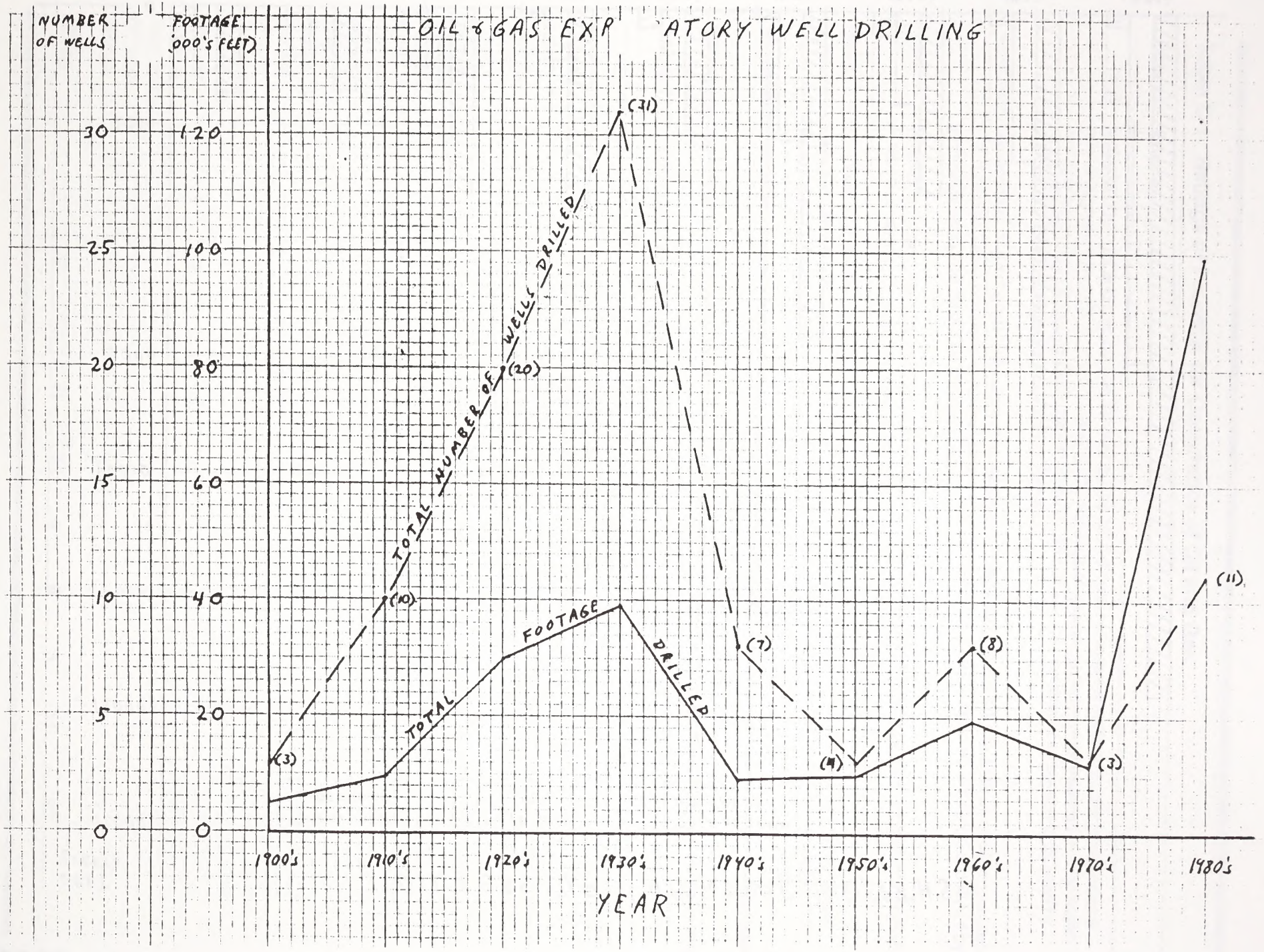

OIL & GAS EXPLORATORY WELL DRILLING
NUMBER OF WELLS
FOOTAGE ('000's FEET)
30
25
20
15
10
5
0
120
100
80
60
40
20
0
TOTAL NUMBER OF WELLS DRILLED
FOOTAGE DRILLED
TOTAL
(31)
(20)
(10)
(3)
(7)
(4)
(8)
(3)
(11)
1900's
1910's
1920's
1930's
1940's
1950's
1960's
1970's
1980's
YEAR

Figure C-2

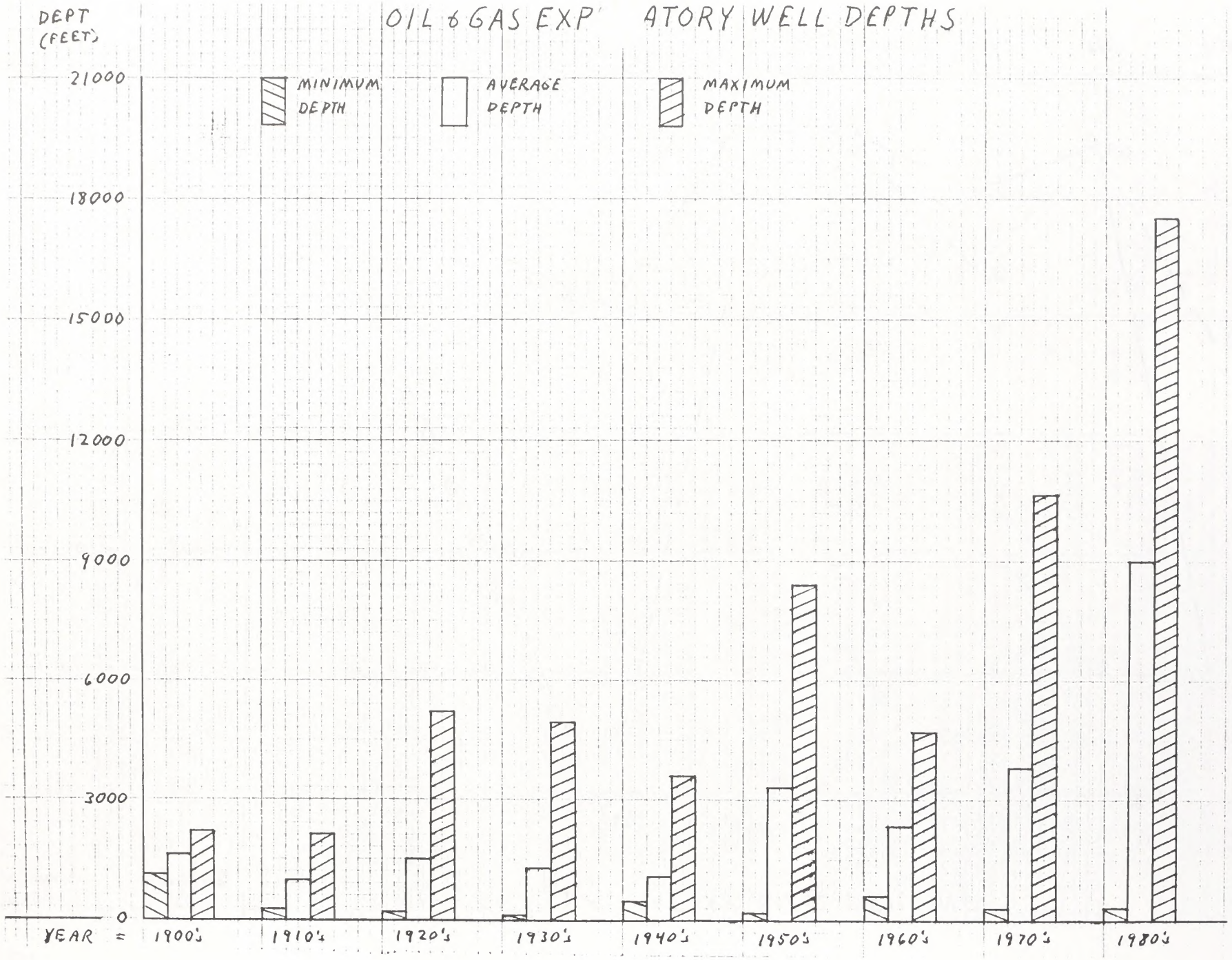

OIL & GAS EXPLORATORY WELL DEPTHS
DEPT (FEET)
21000
18000
15000
12000
9000
6000
3000
0
MINIMUM DEPTH
AVERAGE DEPTH
MAXIMUM DEPTH
YEAR =
1900's
1910's
1920's
1930's
1940's
1950's
1960's
1970's
1980's

Table C-1. Ratings of Potential for Occurrence of Oil and Gas

Potential	Criteria
High	Inclusion in an oil and gas play as defined by the USGS national assessment, or, in the absence of a play designation by USGS, the demonstrated existence of: source rock, thermal maturation, and reservoir strata possessing permeability and/or porosity, and traps. Demonstrated existence is defined by physical evidence or documentation in the literature.
Moderate:	Geophysical or geological indications that the following may be present: source rock, thermal maturation, and reservoir strata possessing permeability and/or porosity and traps. Geologic indication is defined by geological inference based on indirect evidence.
Low:	Specific indication that one or more of the following may not be present: source rock, thermal maturation, or reservoir strata possessing permeability and/or porosity, and traps.
None:	Demonstrated absence of source rock, thermal maturation, or reservoir rock that precludes the occurrence of oil and/or gas. Demonstrated absence is defined by physical evidence or documentation in the literature.

Table C-2. Summary of Drilling

	Number of Exploratory Wells Drilled									
County	**1900's**	**1910's**	**1920's**	**1930's**	**1940's**	**1950's**	**1960's**	**1970's**	**1980's**	**TOTAL**
Adams										0
Asotin		2								2
Benton		5	11	14	1	2	1	1	1	36
Chelan				3						3
Columbia										0
Douglas				1						1
Ferry										0
Franklin										0
Garfield										0
Grant		1		1				1	4	7
Kittitas			1	1	1				4	7
Klickitat				2						2
Lincoln							2			2
Okanogan										0
Pend Oreille							1			1
Spokane	2	2	4	2	1		2			13
Stevens	1			1			2	1	1	6
Walla Walla			1			1			1	3
Whitman										0
Yakima			3	6	4	1				14
TOTAL	**3**	**10**	**20**	**31**	**7**	**4**	**8**	**3**	**11**	**97**

line. Almost all of this activity was in the planning area. During the period from 1980 to 1990, over 118 notices for geophysical work were processed by the BLM for operations on federal lands, or an average of about 11 per year. Additional notices were processed by the Bureau of Reclamation.

During the next fifteen years, an average of about 20 geophysical projects per year are estimated within the planning area. Most of these will probably involve seismic methods. Most projects involve single lines for the vibroseis trucks, but some methods use up to six trucks running in parallel lines. Lines typically are about 20 miles in length, with most activity (estimate 80%) taking place along existing rights-of-way. It is estimated that about 80% of all activity will take place on private and state lands.

2. General Oil and Gas Drilling Activity

Future exploration will most probably occur, as in the past, throughout the Columbia Basin and east-central Cascade Range, with well depths probably continuing in the 10-20,000 ft. range. These exploratory wells will better delineate the boundaries of gas occurrences and may possibly result in the discovery of a new field over the next fifteen years.

Even if the economics become more favorable, the exploration rate would probably increase slowly until enough subsurface data becomes available to enable better targeting of possible gas reservoirs. The inability to transport produced gas and the cost field development and pipeline construction limits favorable targets to those in close proximity to the existing pipelines. Most companies generally will not intensively or diligently drill an area when there is little or no market for the gas.

Based on past activity and professional judgement it is reasonable to expect that the surge in activity from the 1980's will continue into the 1990's. Since 1900, despite several small surges in activity, exploratory drilling levels in the planning area have averaged about 6.5 wells per ten years. The increased drilling activity above this average in the 1920's and 1930's was associated with development of the Rattlesnake Hills gas field. Unless gas price or demand increases substantially, or new methods are developed to reduce the cost per well, about ten exploratory wells are expected during the next fifteen years. Each of these sites would create an estimated 5 acres of surface disturbance for drill pads, and 1-2 acres each for access. Total disturbance would be up to 70 acres. Most exploratory drilling occurs on private or state lands (80%+), so federal surface disturbance might only involve about 14 acres.

If a gas field is discovered and developed, possibly 5 to 39 wells might be needed, involving a total of about 40 to 312 acres disturbance. This would include about 30 to 184 acres for drill pads and access roads, and 10 to 78 acres for pipeline construction within the field. The amount of disturbance to connect the field with an existing pipeline would vary depending on its location within the planning area, but the maximum pipeline length could be about 48 miles. Given the land ownership pattern, a field would typically involve no more than about 60% federal ownership, resulting in an estimated surface disturbance of about 24 to 188 acres on federal lands.

It must be pointed out that future exploration does not necessarily mean that producing wells will be discovered. Only a small percentage of exploratory wells in the planning area have been completed as producers.

Recent economic conditions within the oil industry resulted in a sharp decline in the number of active exploratory wells and the number of developmental wells. A turn around in the oil industry or an increase in the price of oil purchased from abroad, would spur an increase in oil and gas activity in the planning area. Continued low oil prices and depressed economic conditions would result in an increase in the number of abandonments and a decrease in domestic exploration and development.

3. Gas Production

The State of Washington sets spacing unit sizes for the production of gas. Although the federal government is not bound by these spacing unit sizes, they are generally recognized. Gas fields, if discovered in the planning area, would typically be spaced to allow one well per 640 acres. At most, one gas field might be discovered in the next ten to fifteen years if exploration work continues on the current trend.

A typical, future, Spokane planning area gas field with a surface area of 3,000 to 25,000 acres would be expected to require about 5 to 39 wells to be fully developed. Assuming diligent development, these wells would be drilled over a 5 to 10 year period, although the larger field may require a longer time to develop due to the greater expense. No secondary recovery techniques are expected to be used because up to 60% of the original gas in place may be recovered from a typical gas reservoir.

4. Oil Production

Although no oil field discoveries are expected within the planning area, wells drilled during gas exploration will continue to be evaluated for possible oil production. Given the characteristics of the basin, the price of oil is not expected to be a major stimulus for exploration. With domestic consumption rising and the increasing dependency on foreign oil, we can expect oil prices and domestic exploratory activity to increase over the next fifteen years.



20 0 20 40 60 80 100

MILES

EXPLANATION

Alluvial and sedimentary deposits
(Chiefly aquifer-unit groups 1 and 3, table 11)

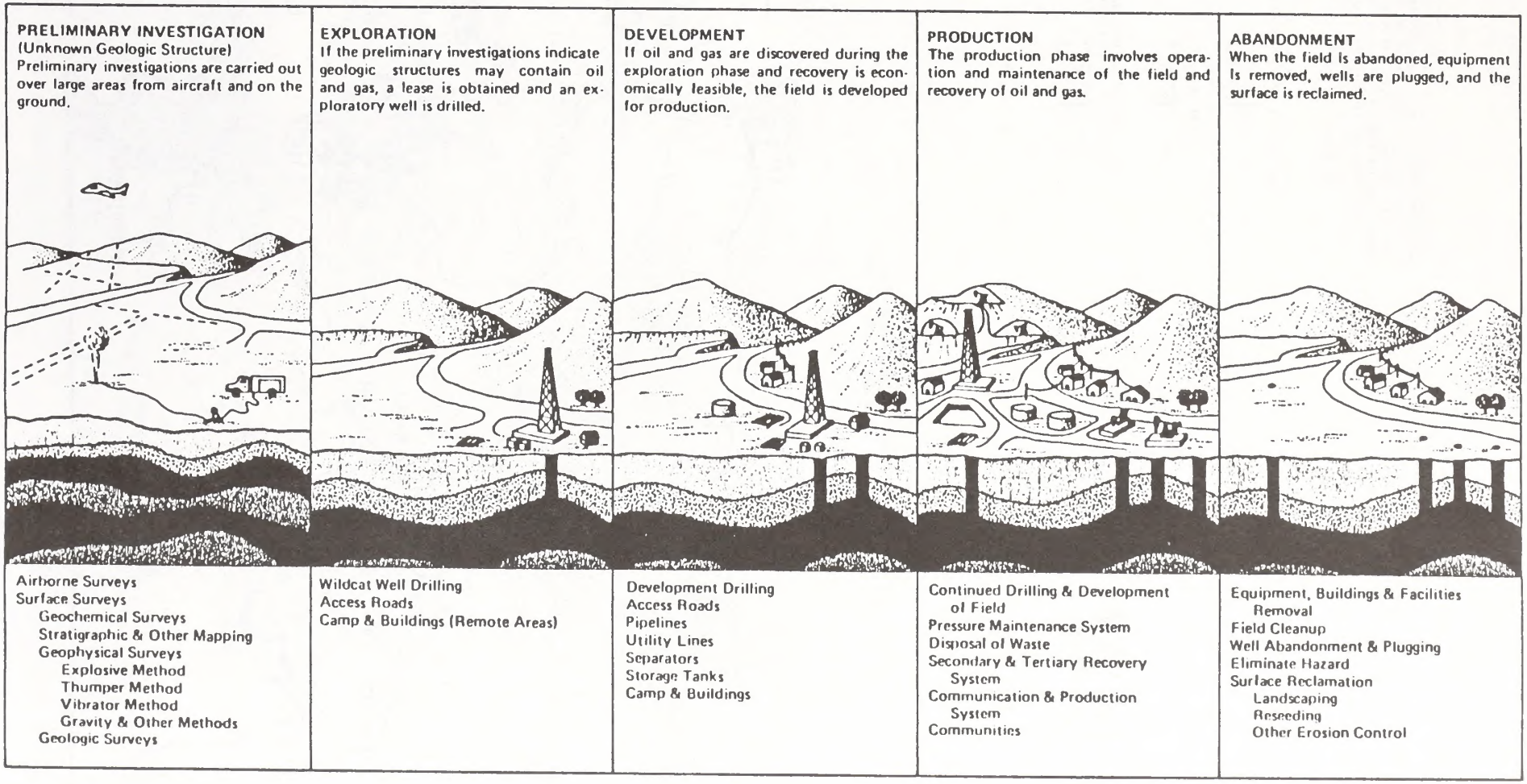
Volcanic rocks
(Chiefly aquifer-unit groups 2, 4, and 5, table 11)

Alluvial, sedimentary, and volcanic rocks
(Chiefly aquifer-unit groups 1-5, table 11)

Note: Major aquifers include those aquifers believed to be generally capable of yielding 100 gpm or more to individual wells. However, these aquifers may have yields considerably below average in some areas, especially where they are fine grained or thin. Also, this is without regard to pumping lift, which may be more than 1,000 feet at some places. Thus, this map is not directly comparable to the subregion maps showing general availability of ground water.

N

MAJOR GROUND-WATER AQUIFERS
THE REGION



SEQUENCE OF OPERATIONS IN AN OIL AND GAS FIELD

Appendix D

Spokane District Special Stipulations

Resource: Long-billed Curlew Nesting Habitat

Stipulations: Seasonal prohibition of oil and gas operations within 400 meters of long-billed curlew nesting areas, from March 15 through July 15.

Objective: To minimize disturbance to long-billed curlew habitat.

Waiver: This stipulation can be waived when the available data shows that the land under the restriction no longer provides suitable nesting habitat anywhere within the leasehold.

Exception: The Authorized Officer can grant an exception to a specific activity if it is determined on a case-by-case basis that curlew are not using the area and that the proposed activities will not significantly degrade the habitat. An exception may be granted for operations conducted on existing roads that have a high volume of traffic.

Modification: A portion or portions of the leased lands can be opened to activity if field inspection shows that this area does not contain nesting habitat, or that curlews are not using the area and that the proposed activities would not significantly degrade the habitat. This stipulation can be expanded to cover additional portions of the lease if these areas are found to contain nesting habitat.

Resource: Wildlife - Raptor Nests

Stipulation: (1) Seasonal prohibition on oil and gas operations from January 1 to August 15, within 800 meters of raptor nests.

Objective: To protect raptor species of concern during nesting.

Waiver: This stipulation can be waived when it can be shown that there are no active nests within the leasehold.

Exception: This stipulation can be excepted if it can be determined that the site-specific project will not affect occupation of the nest within the 800 meter buffer. A lesser distance can be authorized if it is determined by the Authorized Officer that the species of concern would not be affected. An exception may be granted for operations conducted on existing roads that have a high volume of traffic.

Modification: A portion or portions of the leased lands can be opened to activity if circumstances change and the nest is not occupied, or the activity can be modified in a way that will be less disruptive to the species. This stipulation can be expanded to cover additional portions of the lease if additional nests are found.

Resource: Bald Eagle Winter Roosts

Stipulation: (No. 2) Seasonal prohibition on oil and gas operations from November 15 through April 14, within 450 meters of known roost sites.

Objective: To protect occupied habitat at the time when the species is undergoing the most stress from nature and will not tolerate additional stress from activity that might cause displacement.

Waiver: This stipulation can be waived if the habitat is no longer effective as a winter roost anywhere within the leasehold.

Exception: A case-by-case exception to this timing constraint may be granted if the Authorized Officer determines that the roost has minimal use (e.g., due to weather conditions) and the type of operations will not cause a substantial adverse impact. An exception may be granted for operations conducted on existing roads with a high volume of traffic.

Modification: A portion or portions of the leased lands can be opened to activity if it can be determined that an operation of the habitat is no longer effective as a winter roost. This stipulation can be expanded to cover additional portions of the lease if additional roost areas are identified.

Resource: Wildlife - Crucial Winter Habitat

Stipulation: Seasonal restrictions on oil and gas operations from October 15 through April 1 within crucial winter habitat for ungulate species.

Objective: Seasonal restriction is intended to protect the occupied habitat at the time when the species is undergoing the most stress from nature and will not tolerate additional stress from activity that might cause displacement.

Waiver: This stipulation can be waived if the habitat is no longer effective and is not used as winter habitat anywhere within the leasehold.

Exception: A case-by-case exception to this timing constraint may be granted if the Authorized Officer determines that the anticipated impacts will be minimal, due to the type of operation and climatic conditions.

An exception may be granted for operations conducted on existing roads with a high volume of traffic. An exception may also be granted in the event that extension of a project would cause less impact than delaying the project to another drilling season.

Modification: A portion or portions of the leased lands can be opened to activity if the area is no longer effective as habitat and is not used as winter range. This stipulation can be expanded to cover additional portions of the lease if additional crucial habitat areas are identified, or if habitat use areas change.

Resource: Ungulate Species Breeding Areas

Stipulation: Seasonal restriction on oil and gas operations from April 1 through June 30 within bighorn sheep lambing grounds and elk calving areas.

Objective: Minimize disturbance to sheep and elk during sensitive lambing or calving season.

Waiver: This stipulation can be waived if the habitat is no longer effective and is not used as a lambing or calving area anywhere within the leasehold.

Exception: A case-by-case exception to this timing constraint may be granted if the Authorized Officer determines that the anticipated impacts will be minimal, due to the type of operation and climatic conditions. An exception may be granted for operations conducted on existing roads with a high volume of traffic. An exception may also be granted in the event that extension of a project would cause less impact than delaying the project to another drilling season.

Modification: A portion of portions of the leased lands can be opened to activity if a portion of the lands covered by this restriction is no longer effective habitat and is not used as a lambing or calving area. This stipulation can be expanded to cover additional portions of the lease if additional breeding areas are identified, or if breeding use areas change.

Resource: Pygmy Rabbit Habitat

Stipulation: Restrict oil and gas operations activities to the existing roads and trails.

Objectives: To protect Bureau sensitive species habitat.

Waiver: This stipulation can be waived when the available data shows that none of the lands within the lease area contain appropriate habitat.

Exception: An exception to a specific activity can be granted if it is known that pygmy rabbits are not using the area and the proposed activity will not significantly degrade the habitat. An exception may be granted for operations conducted on existing roads that have a high volume of traffic.

Modification: A portion of the leased land can be open to activity if field inspection shows that the lands do not contain appropriate habitat. This stipulation can be expanded to cover additional portions of the lease if additional habitat areas are identified.

Resource: Wildlife - Sage grouse/sharptail grouse leks, nesting habitat, and winter range

Stipulation: CSU for lek: Physical disturbance or change of the character of the habitat within 400 meter radius of the boundaries of the lek is prohibited. Seasonal restriction on oil and gas operations within sight distance or 800 meter radius of leks (whichever is greater) from February 15 through May 1. Seasonal restriction on oil and gas operations within grouse winter range and nesting habitat from November 1 through June 30.

Objective: To protect prairie grouse during sensitive periods.

Waiver: This stipulation can be waived when the available data shows that the portion of the lease under the restriction no longer provides suitable habitat and grouse no longer use the area.

Exception: The Authorized Officer can grant an exception to a specific activity if field inspection shows that grouse are not using the area and the proposed activities would not significantly degrade the habitat. An exception may be granted for operations conducted on existing roads with a high volume of traffic.

Modification: A portion of the leased lands can be open to activity if field inspection shows that grouse are not using the area and the proposed activities would not significantly degrade the habitat. This stipulation can be expanded to cover additional portions of the lease if additional leks, habitat, or winter range areas are identified.

Resource: Special Status Plant Species

Stipulation: All surface disturbing activities are limited to existing roads, until a botanical field inventory of the proposed area of disturbance has been completed. This field survey must be completed during the appropriate season for the identification of special status plants. If special status species or plant community

values are found, the Authorized Officer may determine not to allow activities if they adversely affect the botanical resources.

Exception: An exception to this stipulation may be granted if the Authorized Office determines that one or more of the following has been met at the project area:

1. Existing records indicate that the area involved does not have appropriate habitat.

2. There is an existing, adequate inventory which indicates that special status species or community values are not present, or that these botanical resources will not be affected, or that the adverse impacts will not jeopardize the species or community values.

3. The operator submits a plan which avoids or adequately mitigates impacts.

4. Existing records indicate that an adequate field inventory can be conducted during a different season of the year.

Modification: A portion of the lease may be excluded from the requirement for a field inventory if the Authorized Officer determines that one or more of the following has been met:

1. There has been substantial previous disturbance of the habitat, such as agricultural field cultivation.

2. Existing records indicate that the area involved does not have appropriate habitat.

3. There is an existing, adequate inventory which indicates that special status species or community values are not present, that or these botanical resources will not be affected, or that the adverse impacts will not jeopardize the species or community values.

Waiver: This stipulation can be waived if the Authorized Officer determines that one or more of the following has been met:

1. The entire leasehold surface has been previously disturbed or substantially modified, e.g., cultivation.

2. There is an adequate inventory of the entire leasehold indicating that there are no special status plants, community values or suitable habitat on the entire leasehold.

3. There is an adequate inventory of the entire leasehold which indicates that impacts can be adequately mitigated by avoidance through standard stipulations (i.e., relocation of activities up to 200 meters).

Resource: Reservoirs, Research Natural Areas, Designated Wildlife Reserves, Special Status Plants, and/or Special Plant Community Values

Stipulation: No surface occupancy is allowed within the following lands:

Objective: No surface occupancy is allowed within the following lands:

Objective: To protect reservoirs, Research Natural Areas, wildlife mitigation lands, special status plants, and/or special plant community values (especially relic plant communities, shrub-steppe habitat).

Waiver: The leased lands can be opened to activity if special management designations have ben removed from these lands, or if the resource is no longer classified as having special status or values. No waivers will be granted for reservoir areas.

Exception: The Authorized Officer may grant an exception to a specific activity if it is determined on a case-by-case basis that the type of operations proposed will not cause significant impact to the resource. An exception may be granted for operations conducted on existing roads that have a high volume of traffic.

Modification: A portion or portions of the leased lands can be opened to activity if special management designations have been removed from these lands, or if the resource is no longer classified as having special status or values. This stipulation can be expanded to cover additional portions of the lease if these areas are found to contain special status plants or special plant community values. No modifications will be allowed for reservoir areas.

Resource: Scenic Resources

Stipulation: All operations and surface disturbance must conform to Visual resource Management guidelines: Yakima River Canyon (Class 3), Badger Slope (Class 2).

Objective: To protect scenic resources.

Waiver: The leased lands can be opened to additional activity if the visual resource management rating is changed to a less sensitive rating Class 3, 4 or 5.

Exception: The Authorized Officer may grant an exception to a specific activity if it is determined on a

case-by-case basis that the type and location of operations proposed will not cause significant impact to the resource.

Modification: A portion or portions of the leased lands can be opened to activity if their visual resource management rating is changed to a less sensitive rating of Class 3, 4 or 5. This stipulation can be expanded to cover additional portions of the lease if the visual resource management rating is classified as Class 3 (Yakima River Canyon) or Class 2 (Badger Slope).

U.S. Department of the Interior
Bureau of Reclamation

Standard, Special and Administrative Stipulations for Leasing of Fluid Mineral Resources

and

U.S. Department of the Army
Oil and Gas Leasing Stipulations

United States Department of the Interior

BUREAU OF RECLAMATION
COLUMBIA BASIN PROJECT
P.O. BOX 815
EPHRATA, WASHINGTON 98823

TAKE PRIDE IN AMERICA

AUG 15 1990

RECEIVED
AUG 17 1990
Bureau Of Land Management
Spokane, Wa.

IN REPLY
REFER TO:
CBP-122
LND-1.00

Memorandum

To: District Manager, Bureau of Land Management, Spokane District Office, Spokane WA

From: Project Manager, Bureau of Reclamation, Ephrata WA

Subject: Spokane Resource Management Plan Amendment (RMPA), Fluid Minerals and Related Resources (Land Management Policy)

In response to your memorandum of April 26, 1990, we have reviewed your proposed RMPA addressing oil and gas leasing activities in eastern Washington. Because the proposed RMPA addresses future land use activity on Reclamation-controlled land, we believe that it is essential that all aspects of Reclamation's land management policy be addressed at this time.

Reclamation's primary responsibility is the development and implementation of resource management plans which ensure resource protection and conservation, yet encourage multiple use of Columbia Basin Project (Project) land and water resources. Special emphasis has been placed on the preservation of steppe vegetation and wildlife habitat since a large portion of the Project area is susceptible for fish, wildlife, and recreational development.

Accordingly, we recommend that the following requirements be adopted as the "standards" for mineral leasing, geophyscial exploration, drilling, and recovery operations involving Reclamation controlled land:

STANDARD STIPULATIONS:

Environment

1. National Environmental Policy Act (NEPA) compliance shall be completed by BLM on all Reclamation-controlled land prior to issuance of a mineral lease.

a. All proposed leasing activities shall be in compliance with Section 7 of the Endangered Species Act before leases are issued. Both Federal and State listed species shall apply.

b. Categorical Exclusion Checklist shall be prepared for all proposed operations by a lessee for actions which do not have individual or a cumulative affect on the environment and comply with existing exclusion categories. Copies of all checklists involving Reclamation-controlled land shall be provided to the Project office.

c. Additional NEPA analysis shall be completed should proposed operations by a lessee create a negative impact on the quality of the environment, or involve conflicts with alternative uses. Additional environmental analysis, requirements, and mitigative measures shall become part of the lease agreement.

2. All Reclamation controlled lands proposed for lease shall be inventoried by BLM in compliance with the National Historic Preservation Act and appropriate review and consultation shall be coordinated with the Washington State Historic Preservation Office (SHPO).

a. All sites identified by this inventory shall be avoided. If it is unfeasible to avoid an identified site, a determination of effect, including development of mitigation measures, will be completed prior tc issuance of a lease.

b. Discovery of historical or archeological manifestations by the lessee during exploration and recovery operations shall be reported immediately. The lessee shall discontinue operations and protect the suspected site until it is evaluated by BLM and/or Reclamation archeologists.

Land Management

1. The utmost emphasis shall be placed on avoiding visual impacts, ground disturbance, and degradation of the surrounding ecosystem.

a. All Reclamation-controlled land shall be subject to joint field reviews and approval (lessee, BLM, Reclamation, and administering entity if appropriate) of proposed operations prior to entry.

b. All operations may be subject to annual cumulative timing restrictions of up to 60 days.

c. All operations may be subject to relocation of up to 200 meters.

d. The lessee will be required to take precautionary measures not to transport or otherwise spread noxious weed species within the area of proposed operation.

e. The lessee will be responsible for noxious weed control for 2 years following operations.

f. All Reclamation-controlled land will be open for public use, including but not limited to hunting, fishing, hiking, etc., unless otherwise specified by Reclamation.

g. Appropriate precautions shall be taken to avoid fires and spontaneous combustion.

h. Chemicals, oil, gas, and all other toxic and saline spills shall be immediately cleaned up and disposed of in a previously approved method.

2. Existing roads and trails.

a. Emphasis shall be placed on the use of existing roads and trails.

b. Roads and trails used shall be maintained in such a manner as to control and minimize channeling and erosion.

c. Heavily traveled roads and trails shall be intermittently watered to prevent dust contamination.

d. Upon completion of operations the lessee shall be responsible for restoring the roads and trails to their original condition or better. At the direction of Reclamation roads may be removed.

3. Surface entry (off road).

a. Emphasis shall be placed on the use of helicopters, ORV type vehicles, backpack equipment, and foot traffic for access needs.

b. Surface disturbance and off-road vehicular travel will be limited to access routes previously agreed to during initial joint field review.

c. Vehicular travel shall follow an irregular route in such a manner to prohibit line of sight disturbance.

d. Earth moving equipment will not be used without the prior consent of Reclamation and development of mitigation measures pertinent thereto.

e. During periods of adverse surface conditions such as thawing, heavy rains, snow, or flooding, all vehicle activity shall be suspended until further notice.

f. Natural drainage areas shall not be altered in a manner which would result in siltation or accumulation of debris or cause pollution downstream.

g. No fence shall be cut or damaged unless no other reasonable alternative exists. Access routes through established fence lines will require prior approval. Before cutting any fence, both sides of the proposed cut shall be firmly braced, and a temporary gate will be installed for use during the course of operations unless the fence is immediately repaired. Upon completion of operations, fences shall be restored to their original condition or better.

4. Grazing.

a. The lessee shall coordinate all oil and gas exploration and recovery operations with Reclamation and the existing holders of grazing rights.

5. Restoration requirements.

a. All disturbed areas shall be restored to their original condition by leveling or filling of ruts and gouges in the ground surface.

b. Surface areas compacted by vehicular type activity may require cultivation by mechanical means prior to seeding.

c. All disturbed areas shall be seeded. Site specific vegetation criteria will be provided by Reclamation within 30 days of post-operative review.

d. Mulching may be required in areas susceptible to wind erosion to conserve moisture to enhance seeding success.

e. All debris shall be removed and properly disposed of at an approved disposal site such as a county landfill facility.

f. A 2-year joint post-operative field review between appropriate parties will be required to verify seeding success.

Water

1. Drains, wasteways, streams, canals, laterals, and lakes.

a. All operations shall be conducted in a manner to cause no pollution to bodies of water within the leasehold or downstream therefrom.

b. No operations shall occur within 300 feet of water wells and natural springs without the prior consent of Reclamation. In no instance shall explosives be used or seismic operations occur within ¼ mile of springs and wells.

c. Exploration or recovery operations shall not occur within 500 feet from the centerline of all Project facilities, and ¼ mile from major Project facilities, without the prior consent of Reclamation.

d. Sediment traps shall be installed to collect and settle sediments when operations are in the vicinity of ephemeral or perennial bodies of water.

2. Water use by lessee.

a. Water shall not be removed from any Project water source without the prior approval of Reclamation.

b. Permits for ground water wells shall be obtained from the Washington State Department of Ecology.

c. Water wells constructed by the lessee shall be analyzed and offered to Reclamation for Project purposes prior to abandonment.

NO SURFACE OCCUPANCY (NSO's):

It is our understanding that NSO stipulations should be used when prohibiting surface access is the only viable alternative to protect sensitive resource areas. We believe that all reservoir surface areas, designated wildlife reserves, research natural areas, and areas known to be inhabited by special status plants and animals should be precluded from surface entry. Although we recommend that the following be classified as NSO areas, we have no specific objection to the leasing of the subsurface mineral estate; provided, exploration and recovery operations are performed by directional drilling methods.

Reservoir Areas

Banks Lake Reservoir

Located within Sections 2 through 4, 9 through 11, 14 through 16, 20 through 23, 27 through 29, and 31 through 35, Township 25 North, Range 28 East, W.M., Sections 1, 12 through 14, 22 through 27, 34, and 35, Township 26 North, Range 28 East, W.M., Sections 5 through 7, and 28, Township 26 North, Range 29 East, W.M., Section 1 through 5, 8 through 17, 20 through 23, 20 through 29, and 31 through 33, Township 27 North, Range 29 East, W.M., Sections 6 and 7, Township 27 North, Range 30 East, W.M., Sections 13, 22 through 29, and 31 through 36, Township 28 North, Range 29 East, W.M., and Sections 4 through 10, 15 through 22, and 29 through 31, Township 28 North, Range 30 East, W.M.

Long Lake Reservoir

Located within Sections 9 through 14, 24, 25, and 35, Township 23 North, Range 28 East, W.M., and Sections 19 and 30, Township 23 North, Range 29 East, W.M.

Quincy Habitat Management Area

Located Within Sections 8, 10, 13, 14, 15, and 22 through 26, Township 19 North, Range 23 East, W.M.

Potholes Reservoir

Located Within Sections 1 through 12, 17, and 18, Township 17 North, Range 28 East, W.M., Section 1 through 4, 8, through 17, 20 through 28, and 34 through 36, Township 18 North, Range 27 East, W.M., Section 5 through 8, 16 through 21, and 27 through 34, Township 18 North, Range 28 East, W.M., Sections 32 through 36, Township 19 North, Range 27 East, W.M., and Sections 31 and 32, Township 19 North, Range 28 East, W.M.

Scooteney Reservoir

Located within Sections 10, 11, 14, 15, 22, 23, 26, and 27, Township 14 North, Range 30 East, W.M.

Wildlife Reserves

Columbia National Wildlife Refuge

Research Natural Areas

Castle Rock

Township 27 North, Range 30 East, W.M.

Section 6, that portion of the NE¼NE¼ lying east of S.R. 155.

Township 28 North, Range 30 East, W.M.

Section 31, that portion of the NE¼NE¼, SW¼NE¼, and the W½SE¼ south and east of S.R. 155.

Section 32, NW¼NW¼.

Hiawatha Flats

Township 19 North, Range 26 East, W.M.

Section 8, SW¼.

Shrub Steppe Community Natural Areas

Township 16 North, Range 23 East, W.M.

Section 13, SW¼SW¼.

Section 15, SW.

Section 23, W½NW¼

Section 25, NW.

Township 17 North, Range 23 East, W.M.

Section 26, S½S½.

Section 27, S½S½

Township 17 North, Range 25 East, W.M.

Section 1, NE¼.

Township 17 North, Range 26 East, W.M.

Section 24, NW¼.

Township 17 North, Range 27 East, W.M.

Section 19, N½.

Section 22, SW¼.

Township 17 North, Range 28 East, W.M.

Section 21, NE¼, SW¼.

Township 18 North, Range 23 East, W.M.

Section 7, NW½NW¼.

Township 18 North, Range 24 East, W.M.

Section 3, NW¼SE¼.

Section 5, NE¼.

Section 9, W½W½NE¼.

Section 10, S½.

Section 13, N½S½S½, S½N½.

Township 18 North, Range 25 East, W.M.

Section 7, W½, NE¼

Section 11, SW¼.

Section 16, E½.

Township 18 North, Range 26 East, W.M.

Section 33, W½W½NW¼.

Township 19 North, Range 23 East, W.M.

Section 31, NE¼.

Section 32, NE¼NE¼, NW¼.

Township 19 North, Range 25 East, W.M.

Section 4, W½SW¼.

Section 25, SW½SE¼.

Section 28, NW¼.

Section 33, W½.

Township 19 North, Range 26 East, W.M.

Section 1, E½NW¼.

Section 27, NE¼SE¼.

Section 29, NW¼NE¼, SW¼NW¼.

Township 19 North, Range 27 East, W.M.

Section 15, W½NE¼.

Section 21, W½.

Township 20 North, Range 23 East, W.M.

Section 20, portion W½ east of road.

Section 32, portion W½ east of road.

Township 20 North, Range 25 East, W.M.

Section 20, S½NE¼.

Section 30, NW¼NW¼.

Township 20 North, Range 26 East, W.M.

Section 25, W½NW¼.

Section 35, E½.

Township 21 North, Range 23 East, W.M.

Section 26, NW¼.

Township 21 North, Range 24 East, W.M.

Section 28, W½NW¼.

Township 21 North, Range 25 East, W.M.

Section 32, W½NE¼.

Township 22 North, Range 27 East, W.M.

Section 4, W½E½.

Section 9, N½.

Township 22 North, Range 28 East, W.M.

Section 6, S½NE¼.

Township 23 North, Range 27 East, W.M.

Section 11, NE¼NE¼.

Section 35, NE¼SW¼.

Township 23 North, Range 28 East, W.M.

Section 32, N½NE¼.

Section 34, S½SE¼.

Special Status Plant and Animals

Reclamation is required under the Endangered Species Act to protect plant and animal species that have been listed as endangered and threatened or that are proposed for listing.

The following plant species are candidates on the 1985 Federal Register, Notice of Review for consideration as endangered or threatened species within the Columbia Basin Project.

Persistentsepal yellowcress (Rorippa columbiae)
Hoover's desert-parsley (Lomatium tuberosum)
Northern wormwood (Artemisia campestris)
Washington polemonium (Polemonium pectinatum)
Pauper milkweed (Astragalus misellus)

The State status of threatened and endangered plants listed by the Washington Natural Heritage Program in the "1990 Endangered, Threatened, and Sensitive Vascular Plants of Washington" has persistentsepal yellowcress, Washington polemonium, and Northern wormwood as endangered. Hoover's desert-parsley and Eatonella (Eatunella nivea) are listed as threatened, and an additional seventeen species are listed as sensitive. The above species are known to have distribution patterns within the Project. Currently, there are no known occurrences of threatened or endangered plant species on Reclamation lands. However, our botanical surveys have been very limited.

The following wildlife species have either been identified as threatened or endangered or are under review for consideration as threatened or endangered species within the Project by the United States Fish and Wildlife Service and/or the Washington State Department of Wildlife:

Bald Eagle (Haliaeetus leucocepalus)
Peregrine falcon (Falco peregrinus)
Swainson's hawk (Buteo swainson)
Ferruginous hawk (Buteo regalis)
Long-billed curlew (Numenius americanus)

Sandhill crane (Grus canadensis)
Western sage grouse (Centrocercus urophasianus phais)
Pygmy rabbit (Sylvilagus idahoensis)
Kincaid meadow vole (Microtus pennsylvancus kincaidi)
Giant Columbia River Limpet (Fisherola nuttalli)
Giant Columbia River Spire Snail (Lithoglyphus columbianus)

Because populations of these special status species are not well known, they should be given special consideration when reviewing proposed oil and gas exploration and recovery operations. If special status species are found, they shall be protected by designating the area inhabited as an NSO area and/or developing CSU's that will strictly control proposed surface operations.

TIMING LIMITATIONS:

Timing restrictions deal with individual or cumulative delays that exceed 60 days per year. Examples provided suggested that seasonal delays for winter range, nesting periods, and other similar situations were justification for establishing timing restrictions in excess of 60 days per year.

Accordingly, we recommend that all Reclamation-controlled lands administered by Washington State for fish, wildlife, and recreational purposes be designated as areas susceptible to individual and cumulative delays in excess of 60 days annually. From past experience, there is evidence that lands administered by Washington State may be subject to cumulative delays in excess of 60 days annually for a variety of reasons.

CONTROLLED SURFACE USE (CSU's):

It is our understanding that CSU's are to be used when exploration and recovery operations are authorized, but because of special values or resource concerns, some operations may be strictly controlled.

Relocation of Operations

All Reclamation-controlled land administered by Washington State for fish, wildlife, and recreational purposes should be subject to possible relocation in excess of 200 meters. Our primary concern involves the degradation of shrub steppe vegetation and sensitive wildlife habitat areas.

Dependent upon the size of the leasehold portions, the following designated wildlife areas may be subject to no surface occupancy (NSO).

Crab Creek, Wanapum & Corfu Management Area

Desert Wildlife Management Area

Esquatzel Coulee Management Area

Gloyd Seeps Management Area

Potholes Reservoir Management Area

Quincy Habitat Management Area

Seep Lake Management Area

WB10WW and Ringold Management Area

Winchester Wasteway Area

Wetlands and Marshes

a. Operations within 300 feet of intermittent or perennial water sources, associated floodplains, wetlands, marshes, and riparian areas will not be allowed unless mitigative measures are developed which provide for "no net loss."

b. In no event shall operations within 300 feet of floodplains, wetlands, marshes, and riparian areas involve other than helicopter, backpack, and pedestrian type activity.

Fish, Wildlife, and Recreation

a. All sensitive wildlife and habitat areas shall be protected from surface disturbance to the extent such protection does not unduly obstruct or preclude the lessee from exercising valid existing rights.

b. Access routes into sensitive wildlife and habitat areas used by the lessee may require installation of barriers to protect resources and prevent environmental degradation by third parties.

c. Exploration and recovery operations may require fences and/or other devices to exclude livestock and wildlife from harmful or dangerous areas. The need and type of protection required will be determined on a case-by-case basis.

SPECIAL ADMINISTRATION:

Special administration stipulations are specific one-of-a-kind language similar to Reclamation's Form 3109-1. It is our understanding that BLM would like to eliminate this form. In the event BLM elects to eliminate Form 3109-1, it is essential that the following language be included in all leases involving Reclamation land.

"All lands covered by this lease within the area of any Government Reclamation project, or in proximity thereto, the lessee shall take such precautions as required by the Secretary to prevent any injury to the lands susceptible to irrigation under such project or to the water supply thereof, PROVIDED, that drilling is prohibited on any constructed works or rights-of-way of the Bureau of Reclamation, and PROVIDED FURTHER, that there is reserved to the lessor, its successors and assigns, the superior and prior right at all times to construct, operate, and maintain dams, dikes, reservoirs, canals, wasteways, laterals, ditches, telephone and telegraph lines, electric transmission lines, roadways, appurtenant irrigation structures, and Reclamation works, in which

construction, operation, and maintenance, the lessor, its successors and assigns, shall have the right to use any and all of the lands herein described without making compensation therefor, and shall not be responsible for any damage from the presence of water thereon or on account of ordinary, extraordinary, unexpected, or unprecedented floods. That nothing shall be done under this lease to increase the cost of, or interfere in any manner with the construction, operation, and maintenance of such works. It is agreed by the lessee that, if the construction of any or all of said dams, dikes, reservoirs, canals, wasteways, laterals, ditches, telephone or telegraph lines, electrical transmission lines, roadways, appurtenant irrigation structures or Reclamation works across, over, or upon said land should be made more expensive by reason of the existence of the improvements and workings of the lessee thereon, said additional expense is to be estimated by the Secretary of the Interior, whose estimate is to be final and binding upon the parties hereto, and that within thirty (30) days after demand is made upon the lessee for payment of any such sums, the lessee will make payment thereof to the United States, or its successors, constructing such dams, dikes, reservoirs, canals, wasteways, laterals, ditches, telephone and telegraph lines, electrical transmission lines, roadways, appurtenant irrigation structures, or Reclamation works, across, over, or upon said lands; PROVIDED, HOWEVER, that subject to advance written approval by the United States, the location and course of any improvements or works and appurtenances may be changed by the lessee; PROVIDED, FURTHER, that the reservation, agreements, and conditions contained in the within lease shall be and remain applicable notwithstanding any change in the location or course of said improvements or works of the lessee. The lessee further agrees that the United States, its officers, agents, and employees, and its successors and assigns shall not be held liable for any damage to the improvements or workings of the lessee resulting from the construction, operation, and maintenance of any of the works hereinafter enumerated. Nothing in this paragraph shall be construed as in any manner limiting other reservations in favor of the United States contained in this lease.

THE LESSEE FURTHER AGREES That there is reserved to the lessor, its successors and assigns, the prior right to use any of the lands herein leased, to construct, operate, and maintain dams, dikes, reservoirs, canals, wasteways, laterals, ditches, telephone and telegraph lines, electric transmission lines, roadways, or appurtenant irrigation structures, and also the right to remove construction material therefrom, without any payment made by the lessor or its successors for such right, with the agreement on the part of the lessee that if the construction of any or all of such dams, dikes, reservoirs, canals, wasteways, laterals, ditches, telephone and telegraph lines, electric transmission lines, roadways, or appurtenant irrigation structures across, over, or upon said lands or the removal of construction materials therefrom, would be made more expensive by reason of the existence of improvements or workings of the lessee thereon, such additional expense is to be estimated by the Secretary of the Interior, whose estimate is to be final and binding upon the parties hereto, and that with thirty (30) days after demand is made upon the lessee for payment of any such sums, the lessee will make payment thereof to the United States or its successors constructing such dams, dikes, reservoirs, canals, wasteways, laterals, ditches, telephone and telegraph lines, electric transmission lines, roadways, or appurtenant irrigation

structures across, over, or upon said lands or removing construction materials therefrom. The lessee further agrees the the lessor, its officers, agents, shall not be held liable for any damage to the improvements or workings of the lessee resulting from the construction, operation, and maintenance of any of the works herein above enumerated. Nothing contained in this paragraph shall be construed as in any manner limiting other reservations in favor of the lessor contained in this lease."

Enclosed is a map depicting Reclamation controlled lands within the Project area. For classification purposes said lands have been identified as Project deferred and bypassed lands (yellow), fish, wildlife, and recreational lands (green), reservoir areas (blue), and research natural areas and/or shrub-steppe community natural areas (red).

All oil and gas activity within the Project area should be subject to the above stated standard stipulations (i.e., environment, land management, and water), wetlands and marshes CSU's, and special administration stipulation; unless historical/archeological manifestations or special status plants and animals are located within the leasehold. In the event a special resource value exists CSU's (including possible declaration of an NSO area) shall be stipulated that would prevent a negative impact.

All oil and gas activity involving lands designated as fish, wildlife, and recreational areas and/or wildlife reserves should be subject to the above mentioned standard stipulations, and the stipulations entitled fish, wildlife, and recreation, timing limitations, controlled surface use (CSU's), and NSO's if prohibiting surface access is the only viable alternative. Special emphasis shall be placed on the preservation of shrub-steppe vegetation, and wildlife habitat areas.

Reclamation has no objection to the leasing of United States mineral interests underlying designated reservoir areas. However, reservoir areas and adjoining wetlands should be subject to no surface occupancy stipulations (NSO's). Exploration and recovery operations shall be subject to directional drilling methods.

Designated research natural areas or shrub-steppe community natural areas should be subject to no surface occupancy (NSO's). Exploration and recovery operations shall be subject to directional drilling methods.

In closing, it is our understanding that BLM will develop "standard stipulations" which will be attached to a Standard Oil and Gas Lease (Form 3100-11, dated June 1988). Further, it is our understanding that BLM will establish site specific stipulations under which exploration, development, and abandonment will be permitted on specific leaseholds by use of "Lease Notices," and processing of Notices of Intent (NOI's), Application for Permit to Drill (APD's), Geothermal Development Plans (GDP's), Field Development Plans, Utilization Plans and Permits, and Sundry Notices. In this connection, we believe that the requirements referenced above are consistent with Department of Interior policy, and when referenced in Standard Oil and Gas Lease Agreements should resolve conflicts involving alternative resource values.

If you have any questions or need additional information, please do not hesitate to contact this office. Your inquiries should be directed toward Ed Kemp, FTS 446-0228.

Jim Ede

Enclosures

cc: U.S. Fish and Wildlife Service
P.O. Box 1157
Moses Lake WA 98837

Washington State Department of Wildlife
P.O. Box 850
Ephrata WA 98823

United States Department of the Interior

BUREAU OF RECLAMATION
PACIFIC NORTHWEST REGION
FEDERAL BUILDING & U.S. COURTHOUSE
BOX 043-550 WEST FORT STREET
BOISE, IDAHO 83724-0043

TAKE PRIDE IN AMERICA

IN REPLY
REFER TO:

PN 429

OCT 26 1990

Memorandum

To: Bureau of Land Management, Wenatchee Resource Area, 1133 N. Western Avenue, Wenatchee WA 98801

From: Regional Supervisor of Water, Power and Lands, Bureau of Reclamation, Boise ID

Subject: Oil and Gas Stipulations Pertaining to the Spokane Resource Management Plan Amendment, Bureau of Land Management (Oil and Gas)

Our Yakima Project Office has informed us that the Bureau of Land Management intends to develop a uniform format for oil and gas lease stipulations which will govern a lessee's activities when attached to the Standard Oil and Gas Lease Form 3100-11, dated June 1988.

We have reviewed the proposed stipulations format and do not object to their usage. We understand the Bureau of Reclamation will still have an opportunity to review the proposed lease and will be allowed to include the appropriate information on the proposed stipulation forms.

Mark E. VanDenBerg

OCT 2

DEPARTMENT OF THE ARMY
SEATTLE DISTRICT, CORPS OF ENGINEERS
P.O. BOX C-3755
SEATTLE, WASHINGTON 98124-2255

REPLY TO ATTENTION OF

SEP - 4 1990

Management and Disposal Branch

Bureau of Land Management
Oregon State Office
Post Office Box 2965
Portland, Oregon 97208-2965

Gentlemen:

The report of availability for oil and gas leases at Yakima Firing Center has been approved.

Enclosure 1 is a map indicating the oil and gas lease drilling locations on Yakima Firing Center. The following locations have been identified as potential drilling locations that should not adversely impact military training activities:

(a) Site 1: Section 15, T13N, R23E, W.M.

(b) Site 2: N 1/2 Section 3, T12N, R23E, W.M.

(c) Site 3: Section 5, T12N, R22E, W.M.

(d) Site 4: N 1/2 Section 31, T13N, R22E, W.M.

(e) Site 5: Section 27, T13N, R20E, W.M.

(f) Site 6: Section 31, T14N, R20E, W.M.

(g) Site 7: Section 34, T14N, R19E, W.M.

(h) Site 8: That portion of Section 15, T14N, R19E, W.M., located east of I-82.

(i) Site 9: That portion of Section 30, T15N, R20E, W.M., located east of I-82.

(j) Site 10: That portion of Section 8, T15N, R20E, W.M., located east of I-82

(k) Site 11: That portion of Section 25, T16N, R19E, W.M., located east of I-82.

Enclosure 2 is a list of the lease stipulations established by the Department of the Army to apply to YFC oil and gas leases. These conditions

are to be included in any lease issued. Any deviation from the conditions will require coordination and concurrence prior to granting any lease.

Environmental review of oil and gas leasing action will be performed by your office after a specific site is selected and the necessary documentation will be provided to Fort Lewis.

It is strongly recommended that a memorandum of understanding be prepared between Fort Lewis and the BLM Oregon State Office and/or Spokane District. The roles and responsibilities of each agency need to be clearly understood with regard to environmental compliance, management constraints, military needs, safety, liability, bonding, funding, and eventual rehabilitation.

POC at this office is Mr. Charles Nordling at (206) 764-3745.

Sincerely,

Joseph C. Duncan
Chief, Real Estate Division

Enclosures

Lease Stipulations
Oil and Natural Gas Exploration and Exploitation
Yakima Firing Center Military Reservation, Washington

1. It is understood by all parties that these stipulations may be waived or modified only upon the written concurrence of the Commander, I Corps and Fort Lewis and the Commander, Forces Command.

2. The lessee in accepting this lease understands that the leased lands are part of an active military installation. On-post mineral exploration and development activity is restricted; however, these lands may be explored and produced by drilling concepts from any Army approved on-post location. Surface occupancy upon contaminated lands will not be permitted.

3. Before beginning any exploration/development activity associated with the leased premises, the lessee will submit a proposed plan of operations to the Commander, I Corps and Fort Lewis, for approval. This plan will describe in detail the following activities to be undertaken:

a. Access (e.g., time of year, gates, roads, construction, maintenance, pipelines, vegetation disposal);

b. exploration activities;

c. location, design, and timing of construction of drilling, collection, and storage facilities (e.g., burial of wellhead and equipment in underground bunkers, depth of burial of flow lines);

d. use and protection of installation water supply (e.g., water quality testing). Sources of fresh water on Yakima Firing Center (e.g., ponds, lakes, wells, streams, springs etc.) <u>will not</u> be utilized during any part of the oil and gas development operation. All fresh water will be secured from outside sources and containerized within steel storage tanks;

e. protection of the environment (e.g., hazardous waste areas, endangered species, erosion control, pollution prevention) and protection of objects of historic and scientific significance;

f. safety and fire protection measures (e.g., use of explosives, safe working distances from ammunition and explosives, construction and maintenance of firebreaks, development of contingency plans in the event of danger to persons or property, posting of signs). Not less than three warning signs for any potential surface danger shall be posted on and near the pad/drilling site by the lessee. All warning signs must have minimum dimensions of 3 feet x 3 feet. These signs shall remain in place until all hazards are removed or remedied by the lessee;

g. use of communication and transportation systems;

h. installation security (e.g., authorized operating hours, worker identification);

i. management of production area (e.g., size, fencing, gates, cattleguards, interim revegetation);

j. reclamation measures;

k. attendance at meetings (e.g., pre-operations conference, post-operations conference); and

l. work schedule (e.g., planned beginning date of site preparation, initial drilling date, anticipated duration of drilling activities, planned depth of bore hole); and required areas with appropriately marked maps identifying the following items:

(1) Road locations (existing and proposed) and construction specifications.

(2) Drilling site and pad location (with dimensions and construction specifications). The size of any drilling pad shall be a maximum of 300 x 250 feet. Material used in construction of pad and access road (e.g., rock, sand, or gravel fill) shall be obtained from off-installation sources. For all surface disturbing activities, the topsoil to be removed will be stockpiled for redistribution over the disturbed area prior to reseeding of the site. In areas where excavation will be extensive or extreme, or where bedrock will be encountered, existing topsoil shall be replaced. The determination will be made by the commander's representative at the site during the field investigation as to which sites shall have topsoil stockpiled. Stockpiled topsoil shall be evenly distributed over the entire reseedable area of the drill pad before reseeding takes place.

(3) Drilling site service area (with dimensions and construction specifications of service pad) with location of pumps, lines, compressor, oil tanks, water tanks, etc. All equipment in the service area will be painted with natural non-glossy colors to blend with the surroundings (brown or black), except where safety is concerned. It is the intent of this lease not to allow the installation and utilization of large storage tanks on the Yakima Firing Center, i.e., no storage tank farm.

(4) Locations of any proposed wells, pipelines, fences, and other improvements of facilities. All buried pipelines will be identified by permanent signs placed at 400' intervals and manufactured of materials which will provide reasonable notice of their location at all times. Lessee will be responsible for installation, maintenance and replacement of signs at no cost to government during period of lease. Initial sign installation to be completed within 15 days of completed pipeline within installation boundaries.

4. No oil and natural gas related activity, including bore hole, will be permitted within 2,000 feet of the outer boundary of any surface structure or facility located within the Yakima Firing Center.

5. Use of installation land/roads for access to on-post drilling sites will be permitted, subject to prior written coordination and approval of the Commander, I Corps and Fort Lewis, or his designee. It is the sole responsibility of the lessee to negotiate agreements for use of off-post land required for access to on-post drilling activities. The lessee will hold and save the United States harmless for claims by such third parties arising from the lessee's activities.

6. The lessee will make every effort to locate pipeline and access routes in existing utility and road corridors. The lessee will furnish as-built drawings of completed pipelines at a scale and detail specified by the commander.

7. The lessee in accepting this lease understands that the leased lands are part of a military installation. Mineral exploration and development in any restricted impact areas or areas involving ammunition or explosives is prohibited; however, these lands may be explored and produced by directional drilling at a safe distance from outside the areas as prescribed by Department of Defense (DOD) and Army regulations. Furthermore, the lessee understands that future increased production, testing or storage of ammunition or explosives may further restrict the surface area available for lease operations. Safe distances from ammunition and explosive facilities are based on the quantity and type of explosive present or authorized and the proposed use (e.g., above or below ground, continuous or temporary presence of personnel). The lessee may obtain pertinent information on this subject from the installation safety office.

8. The lessee shall be responsible for damage from fires originating within areas used for drilling activities associated with this lease. The Government will not be responsible for damage to lessee's property resulting from fires originating as a result of the military mission on-post, arson or other accidental or unusual occurrences.

9. Utilization of radio frequency communication for activities associated with this lease must have prior written approval by the Federal Communication Commission (FCC) and the installation commander so as not to interfere with military communications. Additionally, all spark producing machinery, including electrical generators, electrical wiring, etc., shall be suppressed to prevent interference with military communications equipment.

10. Before beginning any approved operations in the leased area, the lessee must consult with third parties authorized to use real estate in the leased area and must document in any proposals for development the manner in which consideration is being given to programs for which third parties have contractual rights and/or responsibility. The

lessee may consult the records of the District Engineer to determine what real estate interests have been granted to third parties on the leased lands. On the request of the BLM District Manager, the commander may seek to resolve disputes between the lessee or operator and third parties if they cannot reach agreement. Resolutions will be coordinated with contracting officers or representatives of all parties involved. The lessee shall hold the United States harmless for claims by such third parties arising from the lessee's activities, including damage to pasture and cropland capabilities.

11. Merchantable timber cleared from roads, pipeline rights-of-way, or drill sites will be disposed of in accordance with the commander's instructions.

12. Lessee compliance with these stipulations will be at no cost to the United States. The lessee shall bear all costs of the following:

a. Increased Government costs for its projects which are incurred by reason of the lessee's activity on the leased premises. Such costs will be paid on a one time basis as a condition of approval of proposed operations.

b. Any Department of the Army costs to administer and ensure lease compliance not otherwise funded by the Congress.

c. The lessee's share of road and bridge maintenance costs for use of installation roads and bridges in accordance with a maintenance agreement. In calculating such costs, the drilling and production area, pipeline rights-of-way, lengths of roads and bridges, and so forth will be considered. Payment shall be made in advance.

d. Repair or restoration for damages or degradation of land or facilities, including that caused by subsidence and pollutant spills, resulting from the lessee's activities. Where conditions of urgency exist as determined by the commander and time is of the essence, the lessee shall repair damages or degradation in a timely fashion in the manner specified by the commander without awaiting confirmation from BLM. The commander shall subsequently confirm oral orders to the lessee or operator in writing. If the lessee or operator cannot or will not comply, the commander may act, and the lessee shall be liable for reimbursement to the Army for all damages and costs of such action, including administrative costs and any surcharges that may be deemed appropriate.

13. The lessee shall not pollute the air, ground, or water (including ground water) or create a public nuisance.

a. Before beginning operations, the lessee shall retain a local agent who may be served notice on these matters and who shall notify the commander immediately of spills, or other unexpected threats or hazards to the environment.

b. The lessee shall hold the United States harmless for any claim, including equitable claims, court or legal expenses incurred by the United States, and fines or penalties imposed upon the United States which are related to unlawful pollution arising from the lessee's use of the property.

c. When gas is burned in the drilling process, the line used to discharge and burn off the gas will be located so as not to damage vegetation in the area. An earthen baffle will be constructed to keep the heat and residue within the operating area. Gas will be burned only during daylight hours in order to eliminate interference with blackout training.

d. Retaining walls are required. Prior to commencement of any drilling operation, an earthen retaining wall shall be constructed, completely surrounding the well site and no closer than 50 feet from the well bore. The retaining wall shall have a compacted height of no less than 2 feet above the ground level at the well bore. An adequate diversion ditch shall be constructed within the 300 foot area, across and around the up-hill edge of the well site to divert surface drainage from the well location.

e. Any fluids trapped or encountered within the well site which contain salt water, hydrocarbons or other potential pollutants, will be pumped into Department of Transportation approved containers and removed from Yakima Firing Center to an authorized disposal site. Freshwater, which contains no significant pollutants, may be pumped out and released outside the diked area if approved by the commander. Earthen reserve pits will not be authorized. All fluids, to include freshwater storage, saline or other toxic fluids will be stored within steel tanks at all times. A containerized mud system will be used. Cuttings must be containerized and removed to an authorized disposal site located off of the reservation unless otherwise approved by the commander. No waste pits are allowed. All tanks and storage facilities will be surrounded by an earthen berm of sufficient height (2:1 slopes) to contain their entire volume in the event of an accidental leak or rupture. Any surface facilities required near the wellhead to treat sour gas or recover gas condensate shall be located so as to minimize their effect on the military mission.

f. Drill stem testing is permitted only during daylight hours. Fluids removed from the well during testing must be pumped into Department of Transportation approved containers and disposed of in accordance with paragraph 13e above. All pumps, compressors, etc., must be well silenced and all mufflers kept in operating condition.

g. Evaporation pits will not be permitted.

14. All artificial lighting used by the lessee or his operators, contractors, servants, employees or agency, for any purpose during the time between one half hour before sunset and one half hour after sunrise shall only be with the prior written consent of the commander

and in a manner which will prohibit all direct light sources, except aircraft obstruction warning lights required by Federal Aviation regulations, from being visible from installation properties and airspace. The commander may further restrict all artificial lighting when deemed necessary for night time training without prior notice to the lessee.

15. Oil and natural gas development are subject to the requirement of the National Environmental Policy Act and the National Historic Preservation Act.

16. All casings shall be new or reconditioned and tested to conform with American Petroleum Institute (API) specifications. All surface casings, production casings and all related equipment items, (e.g., wellhead, valves, etc.), shall have a pressure rating in excess of the highest formation pressure expected to be encountered in the well and shall be tested to conform to API rules.

17. Blowout preventers and related well-control equipment shall be installed, tested, and used in a manner to prevent blowouts.

18. Any electric distribution lines authorized for construction will conform with appropriate raptor protection stipulations. If lines are subsequently abandoned, poles may remain in place only if approved in writing by the commander.

19. Pipelines will be constructed in conjunction with the construction of the access roads whenever possible. Pipelines will be backfilled with dirt from the trench. A berm will be left on top of the backfilled trench to allow for natural settling. Pipeline rights-of-way shall not exceed 25 feet in width. Exact right-of-way widths may be set by the commander when necessitated by the mission or needs of Yakima Firing Center. Pipeline depth must be at least 48 inches. When possible, a single distribution system will be established. A storage tank area (tank farm) will not be established on the military reservation.

20. Portable chemical toilets must be located on all drilling sites. Sewage will be disposed of in a manner to avoid health hazards and be consistent with state and Federal regulations. Trash and all solid waste will be stored in contained trash bins until disposed of. Refuse will be removed as directed by the commander to prevent solid waste pollution on and off the site and the military reservation. In no case, will burning be allowed.

21. During clean-up operations, all cut and fill banks will be sloped to conform with the adjacent landform and in no case shall exceed slopes of 3:1.

22. All drill sites, roads and pipelines will be rehabilitated and revegetated as appropriate. The lessee will contact the commander in relation to the plan of rehabilitation of the sites regarding the time

of seeding, fertilizer application rate and the seed mixture to be utilized. This will be done before release from bond by the Bureau of Land Management. The commander will be advised when each stage of rehabilitation work has been accomplished. If, in the opinion of the commander or authorized official, the first seeding or planting is unsuccessful, the commander may require the lessee to make additional seedings or plantings as necessary.

23. The number of exploration drilling operations on the Yakima Firing Center is limited to two at any one time, unless otherwise approved in writing by the commander.

24. If a productive well results, the wellhead and pipeline are to be buried and covered at a minimum depth of 48 inches and in such a manner as to eliminate interference with all military operations. Locations of all buried wellheads are to be posted and well marked with permanent signs of materials which will provide reasonable notice of their location at all times. Locations will be plotted on a map of scale 1:25,000 and forwarded to the commander.

25. If drilling does not result in a producing well, the well hole shall be plugged and the area returned for Yakima Firing Center use. In the event a producing well is subsequently abandoned, the lessee shall plug the well, remove its equipment and restore all grounds to their original condition, including topsoil, seeding and fertilizing. The plugging of all wells, both dry holes and depleted producers, shall be accomplished in accordance with plugging programs approved by the Bureau of Land Management pursuant to applicable Oil and Gas Operating Regulations, (30 CFR 221).

26. The lessee may be required to clear and maintain firebreaks around drilling sites, roads, fences, pipelines, and other facilities as the commander deems necessary.

27. The lessee shall complete all exploration and development work within a 12 month period after initial surface disturbance.

28. If public domain land is included in this lease, mineral development will not become the dominant use of the land.

29. The United States reserves the option to purchase up to fifty (50%) percent of the natural gas or oil produced or refined at the price defined below under a utility service contract to be negotiated prior to the exercise of this right in accordance with present or future DOD and Army regulations. The lessee or operator shall include this paragraph in any contract or sale of natural gas or oil to other parties.

a. The operator or lessee shall have 4 months from the date it received a notice from the commander or the authorized representative electing to exercise this option, in which to negotiate the specific terms of any sale and begin delivery of the production. Except during

mobilization or surge periods, the commander or the authorized representative shall have the right to change its election under this option no more often than one time every twelve months.

b. The price to the United States shall be the lowest price paid by the wholesale buyer in the area; otherwise standard appraisal methods will be used. In the case of oil production, if the lessee contracts for the sale of its share of any oil production or enters into a processing agreement whereby the lessee receives finished products in lieu of crude oil, the lessee shall include the United States in any such contract under the same terms as the lessee may negotiate for its own account. In all cases, the lessee shall bear all costs on a non-reimbursable basis associated with constructing and maintaining such facilities (including meters) during the producing life of the well and with salvaging such facilities when production is ended.

c. Natural gas shall be dried or processed as necessary and shall be delivered in a condition ready for use in a natural gas system. The lessee or operator shall arrange for equivalent delivery or construct a complete automatic gas supply system from the well to the existing installation gas system according to an commander approved plan. A complete pipeline includes all necessary piping, valves, meters, regulators, fittings, compressors, and odorizers. The lessee shall be responsible for and bear all costs without further reimbursement for the exercise of this option including the costs of refining, processing, and delivering the natural gas to the installation or equivalent delivery of natural gas produced elsewhere as prescribed by the commander or the authorized representative.

d. If exercise of this option involves more than one lessee or operator, the lessee or operator agrees to cooperate with the others in scheduling production, constructing pipelines from wells or gathering points to the installation distribution system, sharing expense, and other matters to assure a timely and continuous fuel supply to the United States.

e. The lessee or operator shall routinely inspect and calibrate equipment involved with the exercise of this option with installation representatives. The commander may require the lessee at least annually to engage an independent party acceptable to the commander to test meters for accuracy and to furnish written findings to the commander.

30. Notwithstanding any other stipulation, the United States and its officers, agents, servants, and employees ("the released parties") shall not be responsible for damages to property, injuries to persons, or any other cause of action ("released actions") which may arise from or be incident to this lease or the lessee's use and occupation of the leased premises. Released actions include, without limitation, damage to the lessee's property, injury to the lessee's person, or other cause of action of the lessee, or such damage, injury or other

cause of action of the lessee's officers, agents, servants, employees, invitees of any of these, or anyone else otherwise on or off said premises incident to the lease. Released actions include any actions arising from flooding of the leased premises. The lessee shall hold harmless and indemnify the released parties for released actions which may arise from or be incident to this lease or the lessee's use or occupation of the leased premises.

31. The lessor's rights described in the printed lease form include the rights of the Department of the Army.

32. The lessee shall furnish the commander a point of contact and back-up point of contact to whom evacuation orders can be issued. The lessee will immediately advise the commander upon any change in these points of contact.

33. The Secretary of the Army or designee reserves the right to require cessation of operations if a national emergency arises or if the Army needs the leased premises for a mission incompatible with lease operations. On approval from higher authority, the commander will give the lessee written notice or, if time permits, request the BLM to give notice of the required cessation. The lessee understands the lease rights granted by this instrument do not include the period of any such cessations and the United States has no obligation to compensate the lessee for damages (including contractual losses) resulting from the exercise of this stipulation. The lessee shall include this stipulation in contracts with third parties to supply oil and gas. This stipulation shall not affect the lessee's right to seek suspension of the lease term from the BLM. Whether or not a suspension is granted will have no effect on cessation of operations as stipulated herein.

34. If the commander or the authorized representative discovers an imminent danger to safety or security which allows no time to consult the BLM, that person may order such activities stopped immediately. The authorized officer of the BLM shall review the order and determine the need for further remedial action.

35. If military contamination is found in the operating area, the operator shall immediately stop work, leave the area, notify the commander, and not return until the commander advises that it is safe to return.

3100 (920)

JAN 23 1991

Joseph C. Duncan
Chief, Real Estate Division
Department of the Army
Seattle District, Corps of Engineers
P.O. Box C-3755
Seattle, Washington 98124-2255

Dear Mr. Duncan:

As per our agreement with representatives attending the meeting at Fort Lewis November 20, 1990, we have compiled an annotated comparison of lease stipulations included in your September 4, 1990, correspondence with the standard stipulations in the National MOU for mineral leases.

The third and fourth columns contain our comments and stipulations we suggest be used for leases issued on the Yakima Firing Center.

As we discussed on November 20, 1990, we suggest many of the specific operating practices be part of the Conditions of Approval rather than lease terms. These items could be incorporated in an Application for Permit to Drill (APD) if and when a drilling permit is received. BLM would prefer to handle those concerns in this manner which would allow the Department of the Army to adjust them based on the specific circumstances of the proposed drilling permit and allow greater flexibility. Because the Commander must concur with the Conditions of Approval for the APD, we believe that we will be able to insure that the lessee/operator understands what is required to protect the military mission.

Also, on January 3, 1991, we FAXed a draft Supplemental MOU to Lynn Walters and are hoping to finalize it by mid-February.

If you have any questions or concerns about this matter, please feel free to contact Nancy Ketrenos at (503) 280-7044.

Sincerely,

PATRICK H. GEEHAN

Patrick H. Geehan
Deputy State Director
for Mineral Resources

cc: 943 w/Encl.
Spokane w/Encl.
WO w/Encl.

RECEIVED
JAN 2 5 1991
Bureau Of Land Management
Spokane, WA

STANDARD ARMY MINERAL LEASING STIPULATIONS	LEASE STIPULATIONS FOR THE YAKIMA FIRING CENTER	RECOMMENDATIONS	RECOMMENDED STIPULATIONS
It is understood by all parties that these stipulations may be waived or modified only upon the written concurrence of the installation commander (hereinafter Commander) and the written approval of BLM's authorized representative.	1. It is understood by all parties that these stipulations may be waived or modified only upon the written concurrence of the Commander, I Corps and Fort Lewis and the Commander, Forces Command.	1. Suggest use of standard wording which includes the written approval of BLM's authorized representative as well as the Commanders.	It is understood by all parties that these stipulations may be waived or modified only upon the written concurrence of the installation commander (hereinafter Commander) and the written approval of BLM's authorized representative.
	2. The lessee in accepting this lease understands that the leased lands are part of an active military installation. On-post mineral exploration and development activity is restricted; however, these lands may be explored and produced by drilling concepts from any Army approved on-post location. Surface occupancy upon contaminated lands will not be permitted.	2. Suggest deleting "concepts" and recommend "however, these lands may be explored and produced by drilling conducted from any Army approved on-post location."	1. The Lessee in accepting this lease understands that the leased lands are part of an active military installation. On-post mineral exploration and development activity is restricted; however, these lands may be explored and produced by drilling however, these lands may be explored and produced by drilling from any Army approved on-post location. Surface occupancy upon contaminated lands will not be permitted.
1. The lessee understands that any lessee activity on the leased lands requires prior approval of the BLM,	3. Before beginning any exploration/development activity associated with the leased premises, the lessee		2. The Lessee understands that any Lessee activity on the leased lands requires prior approval of the BLM,

h. installation security (e.g., authorized operating hours, worker identification);

i. management of production area (e.g., size, fencing, gates, cattleguards, interim revegetation);

j. reclamation measure; or

k.attendance at meetings (e.g., pre-operations conference, post-operations conference).

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l.Items and further requirements not listed in this lease may be covered and be defined in the Conditions of Approval (COA) that will be attached and become part of the approved Application for Permit to Drill (APD) for all drilling and well testing operations. The Conditions of Approval may contain restrictions on the amount of light (s) visible at night, reserve pits, size and configuration of drill pads, and flaring.

(1) All production operations/facilities/pipelines will be approved by Sundry Notice (SN) which

Compliance with these requirements will be at no cost to the United States. The Commander for the purpose of this lease is Commander, _____, and the District Engineer is the District Engineer, _____.

2. The Lessee may only occupy the surface of the lands identified on the attached map, Exhibit ____,

1. work schedule (e.g., planned beginning date of site preparation, initial drilling date, anticipated duration of drilling activities, planned depth of bore hole); and required areas with appropriately marked maps identifying the following items:

(1) Road locations (existing and proposed) and construction specifications.

(2) Drilling site and pad location (with dimensions and construction specifications). The size of any drilling pad shall be a maximum of 300 x 250 feet. Material used in construction of pad and access road (e.g., rock, sand, or gravel fill) shall be obtained from off-installation sources. For all surface disturbing activities, the topsoil to be removed will be stockpiled for redistribution over the disturbed area prior to reseeding of the site. In areas where excavation will be extensive or extreme, or where bedrock will be

These items are submitted in the APD and should be addressed as Conditions of Approval or as Sundry Notices.

The dimensions of the pad should remain flexible depending on the drill site and specified in the Conditions of Approval. The size would be determined by the depth of the well, etc.

will be coordinated with the Commander or authorized representative.

Compliance with these requirements will be at no cost to the United States. The Commander for the purpose of this lease is Commander, Yakima Firing Center, and the District Engineer is the District Engineer, Seattle District

3. The Lessee may only occupy the surface of the lands identified on the attached map, Exhibit ____,

OR 2. The Lessee shall not occupy the surface of the leased lands for any purpose, except for geophysical exploration.

encountered, existing topsoil shall be replaced. The determination will be made by the commander's representative at the site during the field investigation as to which sites shall have topsoil stockpiled. Stockpiled topsoil shall be evenly distributed over the entire reseedable area of the drill pad before reseeding takes place.

(3) Drilling site service area (with dimensions and construction specifications of service pad) with location of pumps, lines, compressor, oil tanks, water tanks, etc. All equipment in the service area will be painted with natural non-glossy colors to blend with the surroundings (brown or black), except where safety is concerned. It is the intent of this lease not to allow the installation and utilization of large storage tanks on the Yakima Firing Center, i.e., no storage tank farm.

(4) Locations of any proposed wells, pipelines, fences, and other improvements of facilities.

All buried pipelines will be identified by permanent signs placed at 400' intervals and manufactured of materials which will provide reasonable notice of their location at all times. Lessee will be responsible for installation, maintenance and replacement of signs at no cost to government during period of lease. Initial sign installation to be completed within 15 days of completed pipeline within installation boundaries.	Based on the site location, the specification for the signs may not be appropriate and flexibility may be to the advantage of the military to specify for the appropriate location.
4. No oil and natural gas related activity, including bore hole, will be permitted within 2,000 feet of the outer boundary of any surface structure or facility located within the Yakima Firing Center.	4. This should be addressed in the Conditions of Approval/Sundry Notice etc.
5. Use of installation land/roads for access to on-post drilling sites will be permitted, subject to prior written coordination and approval of the Commander, I Corps and Fort Lewis, or his designee. It is the sole responsibility of the lessee to negotiate agreements for use of off-post land required for access to on-	5. This should be a condition of approval and should be combined with item 1(1) and item 6. The government is not responsible for, and is

	post drilling activities. The lessee will hold and save the United States harmless for claims by such third parties arising from the lessee's activities.	under no obligation to provide access across non-Federal lands to reach Federal lands. Suggest delete this from COAs.	
3. The lessee will make every effort to locate pipeline and access routes in existing utility and road corridors. The Lessee will furnish as-built drawings of completed pipelines at a scale and detail specified by the Commander.	6. The lessee will make every effort to locate pipeline and access routes in existing utility and road corridors. The lessee will furnish as-built drawings of completed pipelines at a scale and detail specified by the commander.		4. The lessee will make every effort to locate pipeline and access routes in existing utility and road corridors. The Lessee will furnish as-built drawings of completed pipelines at a scale and detail specified by the Commander.
4. The Lessee in accepting this lease understands that the leased lands are part of a military installation. Mineral exploration and development in any restricted impact areas or areas involving ammunition or explosives is prohibited; however these lands may be explored and produced by directional drilling at a safe distance from outside the areas as prescribed by Department of Defense (DOD) and Army regulations. Furthermore, the Lessee understands that future increased production, testing or storage of ammunition or explosives may further restrict the surface	7. The lessee in accepting this lease understands that the leased lands are part of a military installation. Mineral exploration and development in any restricted impact areas or areas involving ammunition or explosives is prohibited; however, these lands may be explored and produced by directional drilling at a safe distance from outside the areas as prescribed by Department of Defense (DOD) and Army regulations. Furthermore, the lessee understands that future increased production, testing or storage of ammunition or explosives may further restrict the surface		5. The Lessee in accepting this lease understands that the leased lands are part of a military installation. Mineral exploration and development in any restricted impact areas or areas involving ammunition or explosives is prohibited; however these lands may be explored and produced by directional drilling at a safe distance from outside the areas as prescribed by Department of Defense (DOD) and Army regulations. Furthermore, the Lessee understands that future increased production, testing or storage of ammunition or explosives may further restrict the surface

area available for lease operations. Safe distances from ammunition and explosive facilities are based on the quantity and type of explosive present or authorized and the proposed use (e.g., above or below ground, continuous or temporary presence of personnel). The Lessee may obtain pertinent information on this subject from the installation safety office.

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8. The lessee shall be responsible for damage from fires originating within areas used for drilling activities associated with this lease. The Government will not be responsible for damage to lessee's property resulting from fires originating as a result of the military mission on-post, arson, or other accidental or unusual occurrences.

9. Utilization of radio frequency communication for activities associated wich this lease must have prior written approval by the Federal Communication Commission (FCC) and the installation commander so as not to interfere with

9. This should be a COA. Recommend replacing with: All spark producing machinery, including electrical generators, electrical wiring, etc., shall be suppressed to prevent interference with communications equipment.

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military communications. Additionally, all spark producing machinery, including electrical generators, electrical wiring, etc., shall be suppressed to prevent interference with military communications equipment.

5. Before beginning any approved operations in the leased area, the Lessee must consult with third parties authorized to use real estate in the leased area and must document in any proposals for development the manner in which consideration is being given to programs for which third parties have contractual rights and/or responsibility. The Lessee may consult the records of the District Engineer to determine what real estate interests have been granted to third parties on the leased lands. On the request of the BLM District Manager, the Commander may seek to resolve disputes between the Lessee or operator and third parties if they cannot reach agreement. Resolutions will be coordinated with contracting officers or

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representatives of all parties involved. The Lessee shall hold the United States harmless for claims by such third parties arising from the Lessee's activities, including damage to pasture and cropland capabilities.

6. Merchantable timber cleared from roads, pipeline rights of way, or drill sites will be disposed of in accordance with the Commander's instructions.

7. The Lessee shall bear all costs of the following:

a. Increased Government costs for its projects which are incurred by reason of the Lessee's activity on the leased premises. Such costs will be paid on a one time basis as a condition of approval of proposed operations.

b. Any Department of the Army costs to administer and ensure lease compliance not otherwise funded by the Congress.

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11. Merchantable timber cleared from roads, pipeline rights-of-way, or drill sites will be disposed of in accordance with the commander's instructions.

12. Lessee compliance with these stipulations will be at no cost to the United States. The lessee shall bear all costs of the following:

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b. Any Department of the Army costs to administer and ensure lease compliance not otherwise funded by the Congress.

c.The Lessee's share of road and bridge maintenance costs for use of installation roads and bridges in accordance with a maintenance agreement. In calculating such costs, the drilling and production area, pipeline rights-of-way, lengths of roads and bridges, and so forth will be considered. Payments shall be made in advance.

d. Repair or restoration for damages or degradation of land or facilities, including that caused by subsidence and pollutant spills, resulting from the Lessee's activities. Where conditions of urgency exist as determined by the Commander and time is of the essence, the Lessee shall repair damages or degradation in a timely fashion in the manner specified by the Commander without awaiting confirmation from BLM. The Commander shall subsequently confirm oral orders to the Lessee or operator in writing. If the Lessee or operator cannot or will not comply, the Commander may act, and the Lessee shall be liable for reimbursement to

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the Army for all damages and costs of such action, including administrative costs and any surcharges that may be deemed appropriate.	the Army for all damages and costs of such action, including administrative costs and any surcharges that may be deemed appropriate.		the Army for all damages and costs of such action, including administrative costs and any surcharges that may be deemed appropriate.
8. The Lessee shall not pollute the air, ground, or water (including ground water) or create a public nuisance.	13. The lessee shall not pollute the air, ground, or water (including ground water) or create a public nuisance.		10. The Lessee shall not pollute the air, ground, or water (including ground water) or create a public nuisance.
a. Before beginning operations, the Lessee shall retain a local agent who may be served notice on these matters and who shall notify the Commander immediately of spills, or other unexpected threats or hazards to the environment.	a. Before beginning operations, the lessee shall retain a local agent who may be served notice on these matters and who shall notify the commander immediately of spills, or other unexpected threats or hazards to the environment.		a. Before beginning operations, the Lessee shall retain a local agent who may be served notice on these matters and who shall notify the Commander and BLM immediately of spills, or other unexpected threats or hazards to the environment.
b. The Lessee shall hold the United States harmless for any claim, including equitable claims, court or legal expenses incurred by the United States, and fines or penalties imposed upon the United States which are related to unlawful pollution arising from the lessee's use of the property.	b. The lessee shall hold the United States harmless for any claim, including equitable claims, court or legal expenses incurred by the United States, and fines or penalties imposed upon the United States, which are related to unlawful pollution arising from the lessee's use of the property.		b. The Lessee shall hold the United States harmless for any claim, including equitable claims, court or legal expenses incurred by the United States, and fines or penalties imposed upon the United States which are related to unlawful pollution arising from the Lessee's use of the property.
	c. When gas is burned in the drilling process, the line used to discharge and	c. This should be a COA. If gas needs to be flared at night for well control, the	

burn off the gas will be located so as not to damage vegetation in the area. An earthen baffle will be constructed to keep the heat and residue within the operating area. Gas will be burned only during daylight hours in order to eliminate interference with blackout training.	Commander and BLM should be notified as soon as possible. An earthen baffle will create additional surface disturbance. The burning of gas only during daylight hours could be dangerous under certain circumstances.
d. Retaining walls are required. Prior to commencement of any drilling operation, an earthen retaining wall shall be constructed, completely surrounding the well site and no closer than 50 feet from the well bore. The retaining wall shall have a compacted height of no less than 2 feet above the ground level at the well bore. An adequate diversion ditch shall be constructed within the 300 foot area, across and around the up-hill edge of the well site to divert surface drainage from the well location.	d. This is appropriately a COA however, a the retaining wall will create a greater surface disturbance than the reserve pit. It will also provide a ponding area for water or H2S if it is encountered.
e. Any fluids trapped or encountered within the well site which contain salt water, hydrocarbons or other potential pollutants, will be pumped into Department of	e. This should be a COA.

Transportation approved containers and removed from Yakima Firing Center to an authorized disposal site. Freshwater, which contains no significant pollutants, may be pumped out and released outside the diked area if approved by the commander. Earthen reserve pits will not be authorized. All fluids, to include freshwater storage, saline or other toxic fluids will be stored within steel tanks at all times. A containerized mud system will be used. Cuttings must be containerized and removed to an authorized disposal site located off of the reservation unless otherwise approved by the commander. No waste pits are allowed. All tanks and storage facilities will be surrounded by an earthen berm of sufficient height (2:1 slopes) to contain their entire volume in the event of an accidental leak or rupture. Any surface facilities required near the wellhead to treat sour gas or recover gas condensate shall be located so as to minimize their effect on the military mission.

Earthen reserve pits may be safer and cause less surface disturbance than tanks. They may be constructed with clay and fabric and reinforced plastic membrane lined. In an emergency, the reserve pits would have a greater emergency capacity than available with tanks.

Again, the berm will create much more surface disturbance than a reserve pit.

f. This should be a COA.

f. Drill stem testing is permitted only during daylight hours. Fluids removed from the well during testing must be pumped into Department of Transportation approved containers and disposed of in accordance with paragraph 13e above. All pumps, compressors, etc., must be well silenced and all mufflers kept in operating condition.

g. evaporation pits will not be permitted.

14. All artificial lighting used by the lessee or his operators, contractors, servants, employees or agency, for any purpose during the time between one half hour before sunset and one half hour after sunrise shall only be with the prior written consent of the commander and in a manner which will prohibit all direct light sources, except aircraft obstruction warning lights required by Federal Aviation regulations, from being visible from installation properties and airspace. The commander may further restrict all artificial lighting when deemed necessary for night

14. This is a COA and, if used, should be combined with Item 13f. We recommend the following COA: Drilling rigs should be marked and lighted(including clearance and warning lights) as specified in writing by the Base Commander. All lights shall be shaded, as necessary, so that there will be no direct interference with night vision.

time training without prior notice to the lessee.

15. Oil and natural gas development are subject to the requirement of the National Environmental Policy Act and the National Historic Preservation Act.

15. This is unnecessary, it is the law.

16. All casings shall be new or reconditioned and tested to conform with American Petroleum Institute (API) specifications. All surface casings, production casings and all related equipment items, (e.g., wellhead, valves, etc.), shall have a pressure rating in excess of the highest formation pressure expected to be encountered in the well and shall be tested to conform to API rules.

16. This should be a COA. See Onshore Oil and Gas Order #1.

17. Blowout preventers and related well-control equipment shall be installed, tested, and used in a manner to prevent blowouts.

17. This should be a COA. Refer to Onshore Oil and Gas Order #1. BLM approves and witnesses tests.

18. Any electric distribution lines authorized for construction will conform with appropriate raptor protection stipulations. If

18. This is appropriately a COA and is required under NEPA.

lines are subsequently abandoned, poles may remain in place only if approved in writing by the commander.

19. Pipelines will be constructed in conjunction with the construction of the access roads whenever possible. Pipelines will be backfilled with dirt from the trench. A berm will be left on top of the backfilled trench to allow for natural settling. Pipeline rights-of-way shall not exceed 25 feet in width. Exact right-of-way widths may be set by the commander when necessitated by the mission or needs of Yakima Firing Center. Pipeline depth must be at least 48 inches. When possible, a single distribution system will be established. A storage tank area (tank farm) will not be established on the military reservation.

19. This should be a Sundry Notice for Production Facilities and combined with Items 3c and (4).

20. Portable chemical toilets must be located on all drilling sites. Sewage will be disposed of in a manner to avoid health hazards and be consistent with state and Federal regulations. Trash and all

20. This should be addressed as a COA.

solid waste will be stored in contained trash bins until disposed of. Refuse will be removed as directed by the commander to prevent solid waste pollution on and off the site and the military reservation. In no case, will burning be allowed.

21. During clean-up operations, all cut and fill banks will be sloped to conform with the adjacent landform and in no case shall exceed slopes of 3:1.

22. All drill sites, roads and pipelines will be rehabilitated and revegetated as appropriate. The lessee will contact the commander in relation to the plan of rehabilitation of the sites regarding the time of seeding, fertilizer application rate and the seed mixture to be utilized. This will be done before release from bond by the Bureau of Land Management. The commander will be advised when each stage of rehabilitation work has been accomplished. If, in the opinion of the commander or authorized official, the first seeding or planting is

21. This is appropriately a COA.

22. This should be a COA.

For the Commander's protection, the release of the bond must be a joint decision between the Commander and the BLM authorized officer because reclamation is not the only condition for the release of the bond.

unsuccessful, the commander may require the lessee to make additional seedings or plantings as necessary.

23. The number of exploration drilling operations on the Yakima Firing Center is limited to two at any one time, unless otherwise approved in writing by the commander.

23. This is addressed in the Supplemental MOU.

24. If a productive well results, the wellhead and pipeline are to be buried and covered to a minimum depth of 48 inches and in such a manner as to eliminate interference with all military operations. Locations of all buried wellheads are to be posted and well marked with permanent signs of materials which will provide reasonable notice of their location at all times. Locations will be plotted on a map of scale 1:25,000 and forwarded to the commander.

24. This should be a COA and combined with Items 3c, 19 etc.

25. If drilling does not result in a producing well, the well hole shall be plugged and the area returned for Yakima Firing Center use. In the event a producing well is

25. This should be a COA and is covered in Onshore Oil and Gas Order #1.

	subsequently abandoned, the lessee shall plug the well, remove its equipment and restore all grounds to their original condition, including topsoil, seeding and fertilizing. The plugging of all wells, both dry holes and depleted producers, shall be accomplished in accordance with plugging programs approved by the Bureau of Land Management pursuant to applicable Oil and Gas Operating Regulations, (30 CFR 221).	We suggest adding Oil and Gas Orders and 43 CFR 3160 which has replaced 30 CFR 221.
	26. The lessee may be required to clear and maintain firebreaks around drilling sites, roads, fences, pipelines, and other facilities as the commander deems necessary.	26. This should be a COA.
	27. The lessee shall complete all exploration and development work within a 12 month period after initial surface disturbance.	27. This may not be feasible. The Shell BN1-9 took approximately 18 months to drill.
	28. If public domain land is included in this lease, mineral development will not become the dominant use of the land.	28. Item 2 explicitly covers this.
The United States	29. The United States	11. The United States

reserves the option to purchase up to_____ _____percent of the natural gas or oil produced or refined at the price defined below under a utility service contract to be negotiated prior to the exercise of this right in accordance with present or future DOD and Army regulations. The Lessee or operator shall include this paragraph in any contract or sale of natural gas or oil to other parties.

a. The operator or Lessee shall have 4 months from the date it receives a notice from the Commander or the authorized representative electing to exercise this option, in which to negotiate the specific terms of any sale and begin delivery of the production. Except during mobilization or surge periods, the Commander or the authorized representative shall have the right to change its election under this option no more often than one time every twelve months.

b.The price to the United States shall be the lowest

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price paid by the wholesale buyer in the area; otherwise standard appraisal methods will be used. In the case of oil production, if the Lessee contracts for the sale of its share of any oil production or enters into a processing agreement whereby the Lessee receives finished products in lieu of crude oil, the Lessee shall include the United States in any such contract under the same terms as the Lessee may negotiate for its own account. In all cases, the Lessee shall bear all costs on a non-reimbursable basis associated with constructing and maintaining such facilities (including meters) during the producing life of the well and with salvaging such facilities when production is ended.

c.Natural gas shall be dried or processed as necessary and shall be delivered in a condition ready for use in a natural gas system. The Lessee or operator shall arrange for equivalent delivery or construct a complete automatic gas supply system from the well to the existing installation gas system according to a

price paid by the wholesale buyer in the area; otherwise standard appraisal methods will be used. In the case of oil production, if the lessee contracts for the sale of its share of any oil production or enters into a processing agreement whereby the lessee receives finished products in lieu of crude oil, the lessee shall include the United States in any such contract under the same terms as the lessee may negotiate for its own account. In all cases, the lessee shall bear all costs on a non-reimbursable basis associated with constructing and maintaining such facilities (including meters) during the producing life of the well and with salvaging such facilities when production is ended.

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Commander approved plan. A complete pipeline includes all necessary piping, valves, meters, regulators, fittings, compressors, and odorizers. The Lessee shall be responsible for and bear all costs without further reimbursement for the exercise of this option including the costs of refining, processing, and delivering the natural gas to the installation or equivalent delivery of natural gas produced elsewhere as prescribed by the Commander or the authorized representative;

d. If exercise of this option involves more than one lessee or operator, the Lessee or operator agrees to cooperate with the others in scheduling production, constructing pipelines from wells or gathering points to the installation distribution system, sharing expense, and other matters to assure a timely and continuous fuel supply to the United States.

e. The Lessee or operator shall routinely inspect and calibrate

system according to a commander approved plan. A complete pipeline includes all necessary piping, valves, meters, regulators, fittings, compressors, and odorizers. The lessee shall be responsible for and bear all costs without further reimbursement for the exercise of this option including the costs of refining, processing, and delivering the natural gas to the installation or equivalent delivery of natural gas produced elsewhere as prescribed by the commander or the authorized representative.

d. If exercise of this option involves more than one lessee or operator, the lessee or operator agrees to cooperate with the others in scheduling production, constructing pipelines from wells or gathering points to the installation distribution system, sharing expense, and other matters to assure a timely and continuous fuel supply to the United States.

e. The lessee or operator shall routinely inspect and calibrate equipment involved

Commander and BLM approved plan. A complete pipeline includes all necessary piping, valves, meters, regulators, fittings, compressors, and odorizers. The Lessee shall be responsible for and bear all costs without further reimbursement for the exercise of this option including the costs of refining, processing, and delivering the natural gas to the installation or equivalent delivery of natural gas produced elsewhere as prescribed by the Commander or the authorized representative;

d. If exercise of this option involves more than one lessee or operator, the Lessee or operator agrees to cooperate with the others in scheduling production, constructing pipelines from wells or gathering points to the installation distribution system, sharing expense, and other matters to assure a timely and continuous fuel supply to the United States.

e. The Lessee or operator shall routinely inspect and calibrate

equipment involved with the exercise of this option with installation representatives. The Commander may require the Lessee at least annually to engage an independent party acceptable to the Commander to test meters for accuracy and to furnish written findings to the Commander.

10. Notwithstanding any other stipulation, the United States and its officers, agents, servants, and employees ("the released parties") shall not be responsible for damages to property, injuries to persons, or any other cause of action ("released actions") which may arise from or be incident to this lease or the Lessee's use and occupation of the leased premises. Released actions include, without limitation, damage to the Lessee's property, injury to the Lessee's person, or other cause of action of the Lessee, or such damage, injury or other cause of action of the Lessee's officers, agents, servants, employees, invitees of any of these, or anyone else otherwise on or off said

with the exercise of this option with installation representatives. The commander may require the lessee at least annually to engage an independent party acceptable to the commander to test meters for accuracy and to furnish written findings to the commander.

30. Notwithstanding any other stipulation, the United States and its officers, agents, servants, and employees ("the released parties") shall not be responsible for damages to property, injuries to persons, or any other cause of action ("released actions") which may arise from or be incident to this lease or the lessee's use and occupation of the leased premises. Released actions include, without limitation, damage to the lessee's property, injury to the lessee's person' or other cause of action of the lessee, or such damage, injury or other cause of action of the lessee's officers. agents, servants, employees, invitees of any of these, or anyone else otherwise on or off said

equipment involved with the exercise of this option with installation representatives. The Commander may require the Lessee at least annually to engage an independent party acceptable to the Commander to test meters for accuracy and to furnish written findings to the Commander.

12. Notwithstanding any other stipulation, the United States and its officers, agents, servants, and employees ("the released parties") shall not be responsible for damages to property, injuries to persons, or any other cause of action ("released actions") which may arise from or be incident to this lease or the Lessee's use and occupation of the leased premises. Released actions include, without limitation, damage to the Lessee's property, injury to the Lessee's person, or other cause of action of the Lessee, or such damage, injury or other cause of action of the Lessee's officers, agents, servants, employees, invitees of any of these, or anyone else otherwise on or off said

premises incident to the lease. Released actions include any actions arising from flooding of the leased premises. The Lessee shall hold harmless and indemnify the released parties for released actions which may arise from or be incident to this lease or the Lessee's use or occupation of the leased premises.

11. The Lessor's rights described in the printed lease form include the rights of the Department of the Army.

12. The Lessee shall furnish the Commander a point of contact and back-up point of contact to whom evacuation orders can be issued. The Lessee will immediately advise the Commander upon any change in these points of contact.

13. The Secretary of the Army or designee reserves the right to require cessation of operations if a national emergency arises or if the Army needs the leased premises for a mission incompatible with lease operations. On approval from higher authority, the

premises incident to the lease. Released actions include any actions arising from flooding of the leased premises. The lessee shall hold harmless and indemnify the released parties for released actions which may arise from or be incident to this lease or the lessee's use or occupation of the leased premises.

31. The lessor's rights described in the printed lease form include the rights of the Department of the Army.

32. The lessee shall furnish the commander a point of contact and back-up point of contact to whom evacuation orders can be issued. The lessee will immediately advise the commander upon any change in these points of contact.

33. The Secretary of the Army or designee reserves the right to require cessation of operations if a national emergency arises or if the Army needs the leased premises for a mission incompatible with lease operations. On approval from higher authority, the

33. We suggest COAs elaborate on emergency procedures.

premises incident to the lease. Released actions include any actions arising from flooding of the leased premises. The Lessee shall hold harmless and indemnify the released parties for released actions which may arise from or be incident to this lease or the Lessee's use or occupation of the leased premises.

13. The Lessor's rights described in the printed lease form include the rights of the Department of the Army.

14. The Lessee shall furnish the Commander a point of contact and back-up point of contact to whom evacuation orders can be issued. The Lessee will immediately advise the Commander upon any change in these points of contact.

15. The Secretary of the Army or designee reserves the right to require cessation of operations if a national emergency arises or if the Army needs the leased premises for a mission incompatible with lease operations. On approval from higher authority, the

Commander will give the Lessee written notice or, if time permits, request the BLM to give notice of the required cessation. The Lessee understands the lease rights granted by this instrument do not include the period of any such cessations and the United States has no obligation to compensate the Lessee for damages (including contractual losses) resulting from the exercise of this stipulation. The Lessee shall include this stipulation in contracts with third parties to supply oil and gas. This stipulation shall not affect the Lessee's right to seek suspension of the lease term from the BLM. Whether or not a suspension is granted will have no effect on cessation of operations as stipulated herein.

14. If the Commander or the authorized representative discovers an imminent danger to safety or security which allows no time to consult the BLM, that person may order such activities stopped immediately. The authorized officer of the BLM shall review the order

commander will give the lessee written notice or, if time permits, request the BLM to give notice of the required cessation. The lessee understands the lease rights granted by this instrument do not include the period of any such cessations and the United States has no obligation to compensate the lessee for damages (including contractual losses) resulting from the exercise of this stipulation. The lessee shall include this stipulation in contracts with third parties to supply oil and gas. This stipulation shall not affect the lessee's right to seek suspension of the lease term from BLM. Whether or not a suspension is granted will have no effect on cessation of operations as stipulated herein.

34. If the commander or the authorized representative discovers an imminent danger to safety or security which allows no time to consult the BLM, that person may order such activities stopped immediately. The authorized officer of the BLM shall review the order

Commander will give the Lessee written notice or, if time permits, request the BLM to give notice of the required cessation. The Lessee understands the lease rights granted by this instrument do not include the period of any such cessations and the United States has no obligation to compensate the Lessee for damages (including contractual losses) resulting from the exercise of this stipulation. The Lessee shall include this stipulation in contracts with third parties to supply oil and gas. This stipulation shall not affect the Lessee's right to seek suspension of the lease term from the BLM. Whether or not a suspension is granted will have no effect on cessation of operations as stipulated herein.

16. If the Commander or the authorized representative discovers an imminent danger to safety or security which allows no time to consult the BLM, that person may order such activities stopped immediately. The authorized officer of the BLM shall review the order

and determine the need for further remedial action.

15. If military contamination is found in the operation area, the operator shall immediately stop work, leave the area, notify the Commander, and not return until the Commander advises that it is safe to return.

and determine the need for further remedial action.

35. If military contamination is found in the operating area, the operator shall immediately stop work, leave the area, notify the commander, and not return until the commander advises that it is safe to return.

and determine the need for further remedial action.

17. If military contamination is found in the operation area, the operator shall immediately stop work, leave the area, notify the Commander, and not return until the Commander advises that it is safe to return.

Appendix E

Areas of Critical Environmental Concern (ACEC)

Recommendation/Rationale for of areas deferred or dropped from consideration.

Aeneas Mountain - This area is located in Okanogan County. It consists of one parcel totaling about 300 acres. This area was recommended for ACEC designation to provide protection and to recognize the importance of the BLM parcels to bighorn sheep inhabiting the area. Bighorn sheep are a Category 2 Federal Candidate specie.

Rationale - The ACEC recommendation has been deferred. Additional inventories are needed to determine the importance of the public land to the bighorn sheep herd inhabiting the area. Until this information is completed this parcel of public land would be monitored to determine if there are any occurring land uses would jeopardize the species or its habitat. If any conflicts are identified, temporary corrective measures would be taken such as fencing, posting of signs, or closing the area to incompatible uses until permanent measures can be taken.

Badger Slope - This area is located in Benton County. It covers about 2,200 acres of public land in the Badger Slope Management Area. It was recommeded for ACEC designation to provide protection for a relic plant community and raptor habitat.

Rationale - The ACEC recommendation has been rejected for the following reasons: 1. There are no immediate threats to raptor nesting habitat. It was believed that restricting ORV use to designated roads and trails would have the same effect as designating the area as an ACEC. 2. The scenic qualities could be maintained by managing this area as a Class II Visual Resource Management area except for the 200 foot wide utility corridor, which would managed as a Class III area.

Boylston Mountain and Whiskey Dick Mountain - These areas are both located in Kittitas County. Boylston Mountain consists of two parcels totaling about 240 acres. Whiskey Dick Mountain consists of two parcels totaling about 480 acres. Both of these areas were recommended for ACEC designation because Taushia hooveri, a Category 2 Federal Candidate plant specie, was located on the parcels.

Sentinel Slope - This area is located in Grant County. It consists of two parcels totaling about 280 acres. One area consists of about 80 acres of public land and was recommended for ACEC Designation because two Category 2 Federal Candidate plant species, Astragalus geyeri, and Lomatium tuberosum were found on the parcel. The 200 acre parcel was recommended because Lomatium tuberosum was found on the parcel.

McCoy Canyon additions - These areas are located in Benton County. They consist of four separate parcels involving about 680 acres of public land. They were recommended for ACEC designation because several concentrations of Astragalus columbanius, a Category 2 Federal Candidate plant specie, were found on the parcels.

Keystone Point - This area is located in Chelan County. It consists of one parcel of public land totaling about 360 acres. This area was recommended for ACEC designation because two Category 2 Federal Candidate plant species, Iliamna longisepala, and Trifollium thompsonii were found on the parcel.

Rationale - The recommendation on designating these areas as ACECs has been deferred until additional inventories can be completed that would either reclassify the specie as a Category 1 or Category 3(c). If it becomes reclassified as a Category I, and it is determined that the BLM parcel is critical to the specie's existence, it would be recommended for ACEC designation and designated in a subsequent planning action. If it is reclassified as a Category 3(c), it would not be designated. Until these inventories are completed, these parcels will be monitored to determine if any occurring land use activities would jeopardize the specie or its habitat. If any conflicts are identified, corrective measures would be taken, such as fencing, posting of signs or closing the area to incompatible uses until permanent measures could be taken.

Buck and Doe Lakes - This area is located in Stevens County. It consists of one parcel involving 240 acres of public land. It has been recommended for ACEC designation to provide protection for important riparian and waterfowl nesting habitat and scenic values.

Rationale - This designation has been deferred until additional information can be obtained regarding the uniqueness of the area. A visual resources evaluation must be conducted, along with an evaluation of the geology to determine the area's uniqueness. In addition, a survey of the riparian habitat should be conducted to confirm or refute the existence of spotted frog habitat along with any other Bureau sensistive species. Until these inventories are completed, these parcels would be monitored to determine if there are any conflicting land uses that would unacceptably alter the

habitat or its scenic values. If any such uses are identified, corrective measures would be taken, such as fencing, posting of signs or closing the area to incompatible uses until permanent measures could be taken.

Wilson Creek - This area is located in Lincoln County. It consists of one parcel totaling about 540 acres. It was recommended for ACEC designation because of its woody riparian habitat.

Rationale - The recommendation on designating this area as an ACEC has been deferred until additional inventories have been completed to determine the importance of the riparian habitat and to determine if there are any additional values that should be afforded protection under ACEC designation. Until these inventories are completed this parcel of public land would be monitored to determine if any occurring land uses would jeopardize its habitat. If any conflicts are identified, corrective measures would be taken such as fencing, posting of signs or closing the area to incompatible uses until permanent measures could be taken.

Mount Hull - This area is located in Stevens County. It is approximately 1,600 acres. This area was recommended for ACEC designation to provide protection to the bighorn sheep habitat and to recognize the importance of the BLM parcels to the bighorn sheep herd. Big horn sheep are a Category 2 Federal Candidate specie.

Rationale - The ACEC recommendation has been deferred until completion of the Habitat Management Plan currently under development. This Habitat Management Plan is being developed in conjunction with one being developed for USFS lands immediately adjacent to BLM. The information gathered during the development of these plans will be used to identify any special management needs and appropriate designation(s). Until these plans are completed, this area would be monitored to determine if any occurring land uses would jeopardize the species or its habitat. If any conflicts are identified, temporary corrective measures would be taken, such as fencing, posting of signs or closing the area to incompatible uses until permanent measures could be taken.

Stoddard Mountain - This area was recommended for ACEC designation to provide protection for a mixed coniferous, old-growth forest plant community.

Rationale - Recommendation of this area for ACEC designation has been deferred because evaluation of the USFS Colville National Forest's Land and Resources Management Plan indicates that about 95,000 acres of forested land in northeastern Washington has been set aside for Wilderness, Research Natural Area or for semi-primitive non-motorized or motorized recreation. An evaluation of these areas should be made to determine the uniqueness or importance of this 300 acres of public land.

Juniper Canyon - This area is located in Klickitat County. It consists of two parcels totaling about 640 acres. This area was recommended for ACEC designation to provide protection and to recognize the important riparian habitat.

Rationale - This area is not recommended for designation because subsequent inventories did not indicate any unique values on the public land.

Rattlesnake Ridge - This area is located in Benton County. It consists of one parcel involving about 120 acres of public land. It was recommended for ACEC designation to provide protection for a relic plant community in a pristine climax condition.

Rationale - The recommendation on designating this area as an ACEC has been deferred. One of the justifications for the ACEC nomination was to protect the relic plant community. The Washington Natural Heritage Plan indicates that this type of community is a Priority 2 element. According to the Washington Natural Heritage Plan, "in most instances, one adequate representative of a Priority 2 element will constitute adequate protection." At this time there is at least one such area or plant community represented. The NHP indicates that there is "Partial representation at Rattlesnake Hills RNA, and at Castle Rock NAP."

Rock Creek - This area is located in Klickitat County. It covers about 3,360 acres of public land in the Rock Creek Management Area. It was recommended for ACEC designation because it provides winter habitat for a migratory mule deer herd, the Lewis woodpecker, and the western gray squirrel, a Bureau sensitive specie. It also provides four miles of resident and anadromous fish habitat and much of the area is composed of an unusual white oak plant community.

Rationale - The ACEC recommendation has been deferred because more information about the uniqueness of the white oak white alder plant community is needed. Until this inventory is completed, these parcels would be monitored to determine if any occurring land uses would jeopardize the plant community or significantly alter the habitat. If any conflicts are identified, corrective measures would be taken, such as fencing, posting of signs or closing the area to incompatible uses until permanent measures could be taken.

Appendix F

Yakima River Canyon Recreation Management Plan Summary

This plan was developed to provide management direction for Umtanum Creek, Squaw Creek, and Roza Recreation Sites in the Yakima River Canyon (YRC).

Another reason for this plan was to provide BLM with a basis for making management decisions relating to the other public lands within the YRC and provide BLM with a mechanism to gather information for the purpose of preparing a River Managment Plan for the YRC.

Management prescriptions are as follows:

1. Promote water safety etiquette at the boat launches and rafting take-out points.

2. Redesign the Roza Recreation Site with emphasis on reducing congestion and designate it as a day-use area.

3. Improve the boat ramp at the Squaw Creek Recreation Site.

4. Upgrade restroom facilities to BLM standards.

5. Construct traffic control barriers at the three recreation sites.

6. Designate separate parking areas for passenger vehicles and other vehicles with boat trailers at the Roza Recreation Site.

7. Establish no-parking areas at the boat ramps and floater take-out points at Squaw Creek and Roza Recreation Sites.

8. Mark the boundary of the recreation sites.

9. Conduct regular patrols of the three recreation sites.

10. Post new signs on the three recreation sites indicating change in administration.

11. Coordinate and develop a multi-agency fire ordinance. (Emphasis would be on reducing wildfires through control of campfire locations and discharge of fireworks.)

12. Prohibit use of fireworks.

13. Restrict ORVs to designated roads on 4,210.5 acres of public land in the YRC.

14. Monitor habitats for Lomathium tuberosum and Erigeron basilticus to detect changes in species numbers and habitat.

15. Establish an information program in the YRC area to assist visitors.

16. Conduct a Class II cultural resources survey of the public lands were recreation use is expected to increase. Conduct a Class I survey on all remaining lands in the YRC recreation area.

17. Restrict access to sensitive habitat areas west of the river during the bighorn sheep lambing season, from May 1 to June 30, to authorized individuals only.

18. Monitor bighorn sheep populations to detect changes in numbers and habitat use.

19. Develop habitat management plan in cooperation with the Washington Department of Wildlife to monitor and manage all wildlife habitat on public lands.

20. Prohibit additional domestic sheep grazing on public land in the YRC.

21. Initiate visitor education programs as necessary to allow for the maintenance and/or enhancement of wildlife populations and habitat.

22. Delineate public lands along the river to minimize inadvertent or accidental trespass as necessary.

23. Acquire the following private lands in: T. 16 N., R. 19 E., section 7 (365.5 acres), section 29 (38.84 acres), T. 15 N., R. 19 E., section 33 (2;72.31 acres). As opportunities develop, acquire other private- or State-owned lands in the YRC to improve recreational opportunities, to provide for protection or improvement of key fish and wildlife habitats, and to provide for the protection of significant cultural resource sites (see Map 2.).

24. Develop site plans for Roza, Squaw Creek and Umtanum Creek recreation sites.

25. Develop a river access point in section 6, T. 16 N., R. 19 E. and on lands acquired in section 7. Designate from 14 to 16 primitive campsites at this site.

26. Control noxious weeds on recreation sites using mechanical means. (Use of herbicides and biological control agents will be analyzed in the District's environmental assessment on noxious weeds.)

27. Provide for a limited number of primitive camp-sites at Squaw Creek (2 to 4) and Umtanum Creek (8 to 10).


LEGEND
Public Lands Administered by BLM
(Dot) Less Than 40 Acres
Bureau of Land Management District/Area Offices
Planning Area Boundary
High Potential for Occurrence of Gas/Oil
Moderate Potential for Occurrence of Gas/Oil
Low to No Potential for Occurrence of Gas/Oil
Depositional Basin
Rattlesnake Hills Gas Field
Deep Well (over 5,000 ft.) With Show of Gas
Deep Well – Drilling Location (no public data)
Shallow Well (less than 5,000 ft.) With Show of Gas (some wells may also have show of oil)
Pipeline
Bureau of Reclamation Columbia Basin Project
Bureau of Reclamation Yakima Project
No Surface Occupancy (NSO)
1 Controled Surface Use, Reservoirs
2 Timing and Controled Surface Use (CSU)
More detailed maps (1:100,000 Scale) are available for review in the public assistance rooms at the following locations:
Spokane District Office, Spokane, WA;
Wenatchee Resource Area Office, Wenatchee, WA;
Oregon and Washington State Office, Portland, OR
LOW TO NO POTENTIAL
LOW TO NO POTENTIAL
HIGH POTENTIAL
HIGH POTENTIAL // MODERATE POTENTIAL
LOW TO NO POTENTIAL
COLUMBIA
BASIN
QUINCY BASIN
OKANOGAN
FERRY
STEVENS
PEND OREILLE
LINCOLN
SPOKANE
DOUGLAS
GRANT
KITTITAS
YAKIMA
CHELAN
OKANOGAN
SPOKANE
Wenatchee
Ephrata
Moses Lake
Quincy
Ritzville
Davenport
Colville
Republic
Newport
Omak
Chelan
Leavenworth
Ellensburg
Yakima
Grand Coulee
Coulee Dam
Kettle Falls
Chewelah
Deer Park
Cheney
Medical Lake
Pullman
Colfax
Dayton
Walla Walla
Columbia River
Snake River
Okanogan River
Methow River
Wenatchee River
Entiat River
Lake Chelan
Lake Roosevelt
Franklin D. Roosevelt Lake
Banks Lake
Moses Lake
Potholes Reservoir
Lake Wenatchee
Lake Entiat
Lake Pateros
Lake Osoyoos
Lake Pend Oreille
Priest Lake
Sacheen Lake
Diamond Lake
Loon Lake
Deer Lake
Medical Lake
Silver Lake
Fishtrap Lake
Rock Lake
Palouse Falls
Steptoe Butte
Kamiak Butte
Mount Spokane
Mount Kit Carson
Mount Stuart
Mount Rainier
Mount Adams
Mount Hood
Mount Saint Helens
Mount Baker
Glacier Peak
Mount Olympus
Mount Rainier
Mount Adams
Mount Hood
Mount Saint Helens
Mount Baker
Glacier Peak
Mount Olympus



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MAP 4

U.S. DEPARTMENT OF THE INTERIOR
Bureau of Land Management
1991

SPOKANE DISTRICT
Leasing Catagories and Restrictions

10 0 10 Miles
Scale

Note:
BLM status is depicted for general use only;
other federal lands not shown. Current land status
on Master Title Plats, maybe obtained through BLM offices.


LEGEND
Public Lands Administered by BLM
(Dot) Less Than 40 Acres
Bureau of Land Management District/Area Offices
Planning Area Boundary
High Potential for Occurrence of Gas/Oil
Moderate Potential for Occurrence of Gas/Oil
Low to No Potential for Occurrence of Gas/Oil
Depositional Basin
Rattlesnake Hills Gas Field
Deep Well (over 5,000 ft.) With Show of Gas
Deep Well - Drilling Location (no public data)
Shallow Well (less than 5,000 ft.) With Show of Gas (some wells may also have show of oil)
Pipeline
Hot Lakes RNA/ACEC
Critical Deer Winter Range
Bighorn Sheep Habitat
Mountain Goat Habitat
Bureau Sensitive Plant Species
A Raptor Nesting Habitat (2/1-7/14)
B Bald Eagle Winter Roost (11/1-4/14)
C Bald Eagle Nesting Territory (1/1-8/15)
D Grouse Leks Nesting Habitat (3/15-7/15)
E Long Billed Curlew (3/15-7/15)
F Pygmy Rabbit
G Wolverine (Year Long)
H Grizzley Bear, Grey Wolf (Year Long)
I Spotted Owl Habitat (Year Long)
J Visual Resources
More detailed maps (1:100,000 Scale) are available for review in the public assistance rooms at the following locations:
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LOW TO NO POTENTIAL
HIGH POTENTIAL
MODERATE POTENTIAL
HIGH POTENTIAL
LOW TO NO POTENTIAL
QUINCY BASIN
KITTITAS BASIN
OKANOGAN
CHELAN
DOUGLAS
GRANT
LINCOLN
SPOKANE
STEVENS
FERRY
PEND OREILLE
SPOKANE
B,H,I
B,H,I
A,D
120°
119°
118°


HIGH POTENTIAL
MODERATE POTENTIAL
LOW TO NO POTENTIAL
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